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A National Newspaper for Every Branch of the Industry

First Copy

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DETROIT

Automotive Daily News

CARS · SHOP EQUIPMENT · TRUCKS · AVIATION · PARTS · ACCESSORIES · TIRES

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First Copy

Harvester Announces New Half-Ton Motor Truck To Be Known as Model D-1

Light Commercial Unit to Be Merchandised to Farm Market, Is Priced at $360 for Chassis; Wheelbase 113 Inches

Chicago, Dec. 29.—The International Harvester Company today announced production of a new half-ton motor truck known as the Model D-1. Some time ago Automotive Daily News announced that an agreement had been completed between Willys-Overland and the International Harvester whereby the former company would manufacture a light commercial unit to be merchandised to the farm market at a low price. The price of the D-1 chassis is $360.

The power plant of this new light truck develops seventy horse power at 3,400 r. p. m. The wheel base of the vehicle is 113 inches. Downdraft carburetion and full-pressure lubrication to main, connecting-rod and camshaft bearings are important engine features. The nine-inch clutch is of the single plate type with built-in vibration damper. The transmission has three speeds forward and reverse. Final drive is of the spiral-bevel gear type with semi-floating axle shafts. Semi-elliptic front and rear springs are of chrome-vanadium steel and have self-adjusting shackles. Forty-spoke eighteen-inch wire wheels, a left front fender well, spare wheel and spare wheel carrier are standard equipment.

Two types of bodies are available. One is a de luxe sedan panel body and the other an all-steel pick-up

(Continued on Page 8)

SHARP EMPLOYMENT GAIN IN AUTOMOTIVE INDUSTRY FOR NOV.

Washington, Dec. 29. — Employment in the automotive industry took a sharp upward turn in November, although there was little change in the general industrial employment situation, according to the monthly survey of the United States Employment Service.

Most of these increases in employment took place in the larger automobile and automobile accessory plants. Thus in Detroit thousands of furloughed employees were recalled to the major automobile and automobile body plants during November. Several departments in these establishments worked overtime, although the majority operated part time, with forces below normal. Plants producing automobile accessories and electrical apparatus were on a restricted production basis.

The same situation with certain modifications appeared in other of

(Continued on Page 3)

VIRGIL JORDAN HEADS CONFERENCE BOARD

New York, Dec. 29.—The National Industrial Conference Board has announced, through John Henry Hammond, chairman of its executive committee, that Virgil Jordan has been designated president of the board, to succeed the late Magnus W. Alexander.

Mr. Jordan was associated with Mr. Alexander from 1920 to 1929 as director of research of the conference board, and during the past three years he has been associated

(Continued on Page 3)

GENERAL MOTORS WILL MAKE SPECIAL EXHIBIT AT WALDORF NEXT WEEK

New York, Dec. 29.—A special exhibit of General Motors products will be presented at the Waldorf-Astoria from January 7 to January 15, inclusive, to which the public is welcome, without any admission charge. It will be open from 11 a. m. to midnight Saturday, and from 10 a. m. to midnight daily thereafter until the exhibition closes, a week from Sunday night.

As a special attraction Saturday night, Oldsmobile's first radio program of the year will be broadcast from the stage of the ballroom, with the following artists present in person: George Olsen and his music, Ethel Shutta, Gus Van, Fran Frey and Hotcha Gardner. They will present an hour of entertainment.

Passenger cars manufactured by General Motors, Buick, Cadillac, Chevrolet, La Salle, Oldsmobile and Pontiac will be displayed. The presentation this year is unusual in that none of the cars shown are more than a few days over a month old and some of them, like Cadillac, La Salle and Oldsmobile, can be seen publicly Saturday morning for the first time in New York.

Joined with the showings by the passenger car divisions of General Motors will be displays of Fisher Body, General Motors Research, Frigidaire and Delco Appliance Corporation.

Fisher Body's part in the exhibi-

(Continued on Page 8)

CHICAGO BOOSTERS PLAN BUSY SEASON

Chicago, Dec. 29.—The luncheon held each Monday by the Chicago Boosters at the Auditorium Hotel under the direction of Richard M. Sheridan will be carried forward during 1933.

The January luncheons which have been scheduled are:

Monday, January 9—Victor C. Anderson, Motor and Axle Parts Service, guest chairman.

Monday, January 16 — Frank Brichalek, Universal Auto Supply Company, guest chairman.

Monday, January 23—Erwin Reed, Evanston Auto Company, guest chairman.

Monday, January 30—Ken Cloud, the Irving-Cloud Publishing Company, guest chairman.

A large valentine party is planned by the Chicago Boosters for Saturday, February 11.

HOFFMAN AND LEWIS TO ADDRESS FOREIGN VISITORS AT N.Y. SHOW

P. G. Hoffman

New York, Dec. 29.—"If I Were a Dealer in 1933" will be the subject of an address by H. Bertram Lewis, vice-president of the Commercial Credit Company at the International Day program which will be held Monday, January 9, by the National Automobile Chamber of Commerce for foreign visitors attending the National Automobile Show in New York that week.

Another speaker will be Paul G. Hoffman, president of the Studebaker Sales Corporation, who will discuss current dealer problems and methods of solving them.

"Service As a Profitable Aujunct" will be presented by S. N. McCaleb of the Hudson Motor Car Company, according to Robert C.

(Continued on Page 11)

ILLINOIS DEALERS TAKE FIRM POSITION ON CURRENT PROBLEMS

Chicago, Dec. 29.—Local trade leaders who traveled to the annual meeting of the Illinois Automotive Trade Association in large numbers today agreed that the sessions at Springfield were the most auspicious in the association's history, particularly from the standpoint of resolutions passed for the protection of those engaged in the manufacture, sale and use of motor cars. They also brought back some important and hitherto unpublished facts about the convention.

Harmony was the keynote of the election of officers and directors, there being no opposition ticket in the field. Officers chosen were as follows:

Herman G. Wangelin, Belleville, president; W. E. Butler, Chicago, first vice-president; William E. Johnston, Peoria, second vice-president, and William W. Yates, Bloomington, treasurer. In addition, the new directors of the association include Thomas J. Hay and L. J. Brady, Chicago; W. C. Starr, Decatur, and Earl G. Taylor, Kewanee. C. W. Coons, secretary and manager

(Continued on Page 11)

NO A. D. N. ISSUE TUESDAY, JAN. 3

Owing to the legal holiday falling on Monday, January 2, Automotive Daily News will not publish on that day and there will be no paper for Tuesday, January 3.

1932 Commercial Vehicle Sales Estimated at 179,568 Vehicles

Estimate Based on November Returns from Forty-Three States Plus Complete Figures for Ten Months; 43% Below Last Year

Detroit, Dec. 29.—R. L. Polk & Company today released commercial vehicle sales figures for November in forty-five states and the District of Columbia. This leaves but three states to be heard from and makes it possible to estimate the November total with considerable accuracy. The total truck sale in the territory indicated in November was 10,154. This compares with 15,292 in November, 1931, and with 14,788 in October, 1932.

Commercial vehicle sales this November were approximately 33 per cent. off from the same month in 1931. The total last November for all the states and the D. C., was 15,553, and on this basis we can be reasonably sure that our commercial sales this November will run about 10,200 units.

With the figures already in hand and complete for commercial sales in the first ten months of 1932 and this estimate for November, it is possible to get a fairly accurate estimate of the total for the present year. The first ten months saw sales of 160,368 commercial units. Add to this the 10,200 estimate for November and allow 9,000 sales for December and we get a total of 179,568 for the year. This compares with 313,884 commercial vehicles sold in 1931. The decrease works out at about 43 per cent.

PIERCE-ARROW NAMES STEPHENS AS GENERAL MANAGER IN CHICAGO

S. A. Stephens

Chicago, Dec. 29.—S. A. Stephens, for many years an outstanding automobile sales executive, has just been made the general manager of the Pierce-Arrow Sales Corporation of Chicago, it is announced by Roy H. Faulkner, factory vice-president in charge of sales. Mr. Stephens comes to Chicago from the Pacific Coast, where he was in supervision of the company's distributing points, including San Francisco, Portland, Seattle, Spokane and Salt Lake City.

Before joining Pierce-Arrow Mr. Stephens was head of two large distributing organizations in Buffalo. Previous to that he was associated for fifteen years with the Dodge forces, rising to the title of Eastern sales manager after holding various executive sales posts.

Assisting Mr. Stephens at the Chicago Pierce-Arrow headquarters, the announcement adds, is Frank C. Grismer, formerly Brooklyn branch manager, who has just been named as retail sales manager here.

CRUDE OIL OUTPUT AND IMPORTS OFF

New York, Dec. 29.—Daily average crude oil production in the United States dropped 34,400 barrels in the week ended December 24, the average daily rate for the period being 2,025,700 barrels, compared with 2,060,100 barrels a day in the previous week and 2,292,900 barrels daily a year ago, according to the American Petroleum Institute.

Crude oil production in all Texas areas was 64,100 barrels a day under the previous week, but this cut was offset in part by an increase of 26,150 barrels daily from Oklahoma wells. Although the complete shutdown took effect in the prolific east Texas field late in the week, the daily average from that area was 283,450 barrels, or 51,000 barrels daily under production for the previous week. Prior to the shut-down being put into effect there was the usual scramble by independent well owners in east Texas to bring as much oil from the ground as possible.

Imports of crude and refined oil at principal United States ports for the week ended December 24 totaled 642,000 barrels, a daily average of

(Continued on Page 8)

G. M. WILL ENTERTAIN MANAGERS, SALESMEN AT SHOW BREAKFAST

New York, Dec. 29.—As the opening gun of the 1933 show campaign, General Motors on Saturday, January 7, will entertain all its zone and regional managers at breakfast. Salesmen who are to be on duty at Grand Central Palace at the national show, and those who will hold forth at the G. M. special exhibit at the Waldorf-Astoria will also be the guests of the corporation on that occasion.

Breakfast will be served in the grand ballroom of the Commodore at 8 o'clock. R. H. Grant, vice-president in charge of sales for General Motors, will make the only talk, sending his charges into battle full of vim, vigor and vitality.

CONN. TRUCKERS NOMINATE SLATE

Hartford, Conn., Dec. 29.—Stephen L. Smith, secretary and assistant treasurer of the H. T. Smith Express Company, Meriden, has been nominated for re-election as president of the Motor Truck Association of Connecticut, Inc., which will hold its annual meeting at the Bond Hotel here Monday, January 9, according to announcement by Myles W. Illingworth, executive secretary.

Other nominations submitted by the nominating committee, of which Clovis Loreaux, Jr., is chairman, to be voted upon at the annual meeting are as follows:

Vice-president — Harold C. Davis, Seaboard Freight Lines, Inc., Hartford.

Treasurer—H. A. Sillence, H. A. Sillence Co., Hartford.

Directors—Everett J. Arbour, Con-

(Continued on Page 11)

SIMPLE APPARATUS TESTS OIL VISCOSITY

Atlantic City, N. J., Dec. 29.—A new apparatus to determine the viscosity of oil so simple that it may be operated by a schoolboy, and so efficient that it eliminates errors now commonly attributed to sensitive viscometers, was described today by Eugene Willihnganz of Pennsylvania State College before the Society of Rheology, meeting here in conjunction with the American Association for the Advancement of Science.

Viscosity—the mucilaginous quality of oil—is of direct importance to America's motorists, because it is the most direct measure of lubricating value known to science at present. The most serviceable motor oil is that which retains the desired viscosity throughout the range of temperatures in which the car is to be operated.

The new viscometer developed by Mr. Willihnganz, physical chemist at Pennsylvania State, consists of two bulbs connected by capillary, the combination constructed as part of a U-shaped tube. The lower half of the tube is offset to bring one bulb directly below the other. For its accuracy the viscometer depends on the size of the capillary connecting the two bulbs, the shape and size of the bulbs and their position in relation to each other. The entire instrument is about eight inches long.

"In operation," Mr. Willihnganz said, "the oil to be tested is placed in the upper bulb, and the time required for it to flow into the lower bulb is recorded. The time may be translated directly into viscosity by means of a table or through a simple formula."

One of the most troublesome sources of error with the older instruments—that of the viscometer being slightly out of plumb—has been greatly reduced, Mr. Willihnganz asserted. He held that the allowable variance from vertical in his viscometer is 700 times greater than that of the older types.

EMPLOYMENT GAINS REPORTED FOR JERSEY

Trenton, N. J., Dec. 29.—The upward trend in employment and manufacturing, indicated in reports to the State Department of Labor during September and October, slumped again during November. Statistics announced by Commissioner Blunt today indicated a decrease of 1.1 per cent. in employment during November, 4.5 per cent. in pay rolls and 3.4 per cent. in average weekly earnings, as compared with the preceding month.

The statistics include 701 establishments embracing fifty-six of the principal manufacturing industries of the state. These plants employed during November an average of 160,047 workers, with total weekly earnings of $3,309,329. This is a decrease of 1,822 in the number of persons employed and of $157,820 in wages paid during the week in November selected for comparison with a corresponding week in October. The average weekly earnings decreased from $21.42 to $20.68.

LOUISVILLE CANCELS PLANS FOR ANNUAL AUTOMOBILE SHOW

Louisville, Ky., Dec. 29.—Directors of the Louisville Automobile Dealers Association, meeting yesterday, decided that there would be no show held in 1933. Louisville since about 1904 has skipped only about two shows, one because the show house burned just before the show was to open and the other because of the war.

However, this year most of the models have been announced and are already on display on dealers' floors, and the few remaining new cars not shown so far will be at the national or New York show in early January, and will be on local dealers' floor about the same time.

Sales have been very light the past year, and a number of dealers were of the opinion that the costs of the show would be far greater than any benefit that might be derived this season.

BENDIX TO PUSH NEW B-K VACUUM BRAKE

Chicago, Dec. 29.—A vigorous advertising and merchandising campaign on the B-K vacuum power brake has been undertaken and will be continued throughout 1933, it was made known today at headquarters of the Bendix Aviation Corporation. Officials of the company have decided to make this product one of their specialties next year. They are enthusiastic over its results when applied to either passenger or commercial cars, since it requires only a slight pressure to bring the vehicle to a stop.

CANADIAN AUTOMOTIVE PLANTS MORE ACTIVE

Toronto, Canada, Dec. 29.—Automotive manufacturing activity continues to increase on all sides in Ontario. General Motors of Canada has production of the McLaughlin-Buick and Chevrolet 1933 models under way and announces that production of Pontiacs, Oldsmobile, La Salle and Cadillac will soon follow. The Studebaker plant at Walkerville, Ont., has called back 300 men to work and the Hudson-Essex plant at Tilbury, Ont., has increased its factory staff to 600 men. These new plant activities at Walkerville and Tilbury occurred this week.

STUDEBAKER ADDS NEW TRUCK DEALERS

South Bend, Ind., Dec. 29.—The following new truck dealers have been added by the Studebaker Corporation: Kaemmerling Motor Company, Peoria, Ill.; Al Labrucherie, Stockton, Cal.; Walter M. High, Burlingame, Cal.; St. Louis Casket Company, St. Louis, Mo.; De Massi Motor Car Company, Lyndhurst, N. J.; Foust Brothers, Hudgesville, Pa.; Nicolai Garage, Cromwell, Ind.; Robert A. Oliver, Oneonta, N. Y.; Orchard Motor Sales, Indian Orchard, Mass., and V. P. Motors, Danville, Ill.

AUTO SHOW

See What's New at This Great Show!

Cars, Accessories, Commercial Vehicles — Hundreds of innovations for 1933 — Never before such car values.

January 7—14 10 A. M. TO 10.30 P. M.

PLAN NOW TO ATTEND

GRAND CENTRAL PALACE

FINANCIAL NEWS

REO

Lansing, Dec. 29.—Stockholders of Reo Motor Car Company, at a special meeting, voted to reduce the authorized capital from $20,000,000 to $10,000,000, changing the par value of the stock to $5 a share from $10. Stockholders also approved the recommendation of directors to write down fixed assets by $4,479,766 and to set up a contingency reserve of $405,545.

CRUDE PRICES

Tulsa, Okla., Dec. 29.—A new angle to the mixed crude oil price situation developed today when H. F. Wilcox Oil and Gas Company announced that as of January 1, it would pay for crude oil in Oklahoma and panhandle Texas on the basis of what low octane United States motor is quoted by a Chicago trade paper. For each one-eighth cent it will pay 2½ cents a barrel, starting at 60 cents for 40 and above on the present quotation of 3 cents in tank-car lots.

WILCOX OIL

Oklahoma City, Dec. 29.—The Corporation Commission, which tomorrow will take nominations of what pipe lines want from the Seminole oil field in January, today asked the State Supreme Court to make more clear and specific its rulings against the commission's enforcement of proration, and which penalized H. F. Wilcox Oil and Gas Company from operating its wells there.

COPPER

New York, Dec. 29.—Some of the foreign copper producers have raised prices in the export market and are now asking 5.15 cents a pound delivered at European ports, according to the trade. The general range of export copper prices, however, is 5.05 to 5.10 cents a pound, with sales reported at both levels.

Domestic demand remains light and the price is unchanged at 5 cents delivered to the end of March and 5⅛ to 5¼ cents a pound quoted for second quarter shipment.

SPECIAL PLATES FOR INSURED CARS PLAN STUDIED IN BAY STATE

Boston, Mass., Dec. 29. — Morgan T. Ryan, registrar of motor vehicles, is studying a plan which is designed to automatically keep noninsured cars off the roads. The plan follows:

First, to eliminate the great expense and labor in connection with the cancellation of insurance policies for nonpayment of premium, and, second, to remove from the road the large number of automobiles the insurance on which has been canceled, but because of defective addresses the license plates remain in possession of the operator.

All license plates to be issued as at present, but to have in one end a slot, into which monthly shall be inserted a number issued by the company insuring the car; these numbers to run from 1 to 12 (one for each month) the same size as those on the plate but of a different color. An automobile owner who pays his premium in advance will receive the twelve monthly numbers with his insurance policy.

The owner who is granted two months' credit will receive two numbers and the remaining ten when he pays his premium in full. The owner whose premium is financed will receive one each month as he makes his payment. The result is obvious. No cancellations will be necessary for nonpayment of premium. Police and inspectors will see at a glance if cars are properly insured and there will be no cars on the road without insurance.

A somewhat similar plan has been put in operation in the State of New York, where all buses and public passenger conveyances are required to carry a monthly ticket on the windshield of the car.

CANADIAN CAR EXPORTS ZOOM IN NOVEMBER

Toronto, Canada, Dec. 29 (UTPS). —Nearly a 400 per cent. increase in the export of automobiles made in Canada is reported for November of this year by the Dominion Bureau of Statistics.

SPARKS *from* DETROIT

Betwixt and Between

* * *

Over-Xmas Adventures

* * *

Habel's Charts

* * *

Reaches the Bottom

* * *

Chris Sinsabaugh—Detroit Editor

BETWIXT and between Christmas and New Years it's hard to find material for the column. The New York show is only a stone's throw away; the industry is sitting with its hands folded, everything attended to as far as possible in the way of preparation for the national exhibition—the lull before the storm. Sales executives are at their desks. No use to go out and contact dealers now. Those who haven't been visited lately on 1933 matters will be at New York. So we sit twiddling our thumbs, waiting to go over the top.

* * *

WHAT TO WRITE, what to write? Why not talk about beer, seeing as how some of the manufacturers are planning to produce beer trucks in anticipation of the Senate okeying the beer measure, as did the House, and President Hoover not vetoing it?

So I'll get technical and hand out to you the comment of a malster who knows a friend of a friend of mine and who declares that we will get a big package with 3.25 beer. That content sounds low when we think of Canada with 9 per cent., but our 3.25 will be as comparable as the English horse-power automobile rating, purposely made low because of excessive taxation on horse power, but really two or three times more.

Canada's 9 per cent., he says, will not pass a test of over 3.2. And he recites that, after all, it is not alcoholic content that makes for beer palability. Pilsner is only 2.75; but, oh boy, the taste! Too much alcohol in beer, he says, is like too much salt in the soup.

* * *

CONTINUING the this-and that character of today's column, there are the over-Christmas adventurers of Ray Ostell and Fred Ewald, colleagues of mine in the Macfadden suite in the Fisher Building here. They rate as automobile men, for the sell advertising for Liberty Magazine.

Ostell went to Chicago for Christmas. He drove there, and on Tuesday we get the report that some one stole his car. Ewald didn't come to the office Tuesday morning. A shorted wire under the floor of his living room started a fire that certainly raised Old Ned.

* * *

WITH ALL THE NEWS and enthusiasm regarding new models already announced and yet to come before show time, the selling crews, sales managers and salesmen are showing equally as much interest and enthusiasm about the salesmen's compensation charts for new and used cars recently announced in A. D. N. by Barney Habel, the Chevrolet dealer in Pontiac, one of Detroit's suburbs, so to speak.

The charts seem to fill a very definite need for dealers who are selling cars in the $400-$1,200 class, and used car sales managers see in the plan a solution of the many problems of the past, particularly as the used car compensation charts establish a definite rate of commission payment, something, I am informed, never has been set up before.

It looks as if the "depression period" of the past year has resulted in some deep thinking on the part of at least one automobile dealer that may be of great help to a lot of other retailers in their 1933 sales campaigns.

* * *

CANADA WENT for the Fisher Body Craftmen's Guild good and strong this year, but returns from the Dominion indicate that the enthusiasm is running even higher on the 1933 competition. In the 1932 competition there were 15,000 boys enrolled for the rich prizes hung up, not forgetting, of course, the scholarship prizes, but to date this has been doubled, more than 30,000 lads having signed up. The Canadians are ambitious, tough, and are out to reach the 50,000 mark.

* * *

THIS AND THAT AGAIN, grist for this mill having come in from Akron, where the B. F. Goodrich Company has been seeing to it that all their part-time and former employees have something to eat, provided they work for their good. Goodrich has a 275-acre tract which has been converted into a huge vegetable garden, which has been handled by 1,000 men, who received product in direct proportion to the time they spent on the soil. More than 500 tons of garden truck were raised this year. This is believed to be the largest project of its kind in the country.

* * *

I didn't think I would make it, but here's the bottom of the column!

Retail Salesmen—This Is Your Page

This department is devoted to the interests of the retail sales division of the industry. Salesmen, this is your department. Automotive Daily News wants you to get something from this department that will help you in your work on the firing line. It wants you to pass on your own experiences, success, failures to help your brother salesmen. Send in your story in the form of a letter, or even a postal card, and let us get it ready for publication. Your achievement or your mistake may help another salesman to make sales or avoid errors that cost you commissions.

Dealers read this page. Give us the benefit of your reactions on these problems that affect the work of your salesmen, the men on the firing line, the men who bring home the bacon or don't.

NEW MAINTENANCE SALES IDEA IS "THRIFT SAVINGS CLUB"

(Part 2)

By K. H. LANSING

In a previous article the new "Thrift Savings Club" idea embodied in the recently opened maintenance sales department of the Teefy-Seltz Company, Inc., Philadelphia, was described. In that article it was mentioned that memberships or membership service books, entitling the holders to special privileges and benefits, including free service items and discounts, were sold to car owners by direct mail and personal solicitation, with a certain amount of telephoning supplemented when necessary.

The following forms were those used in the Teefy-Seltz maintenance sales department campaign in Philadelphia to obtain membership in the Thrift Savings Club through direct mail and by telephone. These forms consisted of three letters and a post card.

The first letter in the series reads:

"Dear ..... Owner:

"We are offering ..... owners the privileges of a membership in the Thrift Savings Club. A membership in the club entitles you to the following free service and discounts: Free motor tune-up, free battery charge, free brake inspection, free tow-in in case of accident, free front wheel alignment test, free tubes on purchases of tires, 10 per cent. discount on service-parts work, 15 per cent. discount on all accessories."

"And these free service items and discounts are but a part of the total service savings the club members reap. You cannot afford to lose the dollars and cents advantages of belonging to the club.

"As the number of our allotted memberships is limited, we suggest you secure yours by calling at our service station, the club official station, 21st and Hamilton streets, or by phoning 'Service,' Poplar 2900.

"TEEFY-SELTZ CO., INC.
"Edward W. Graham.

"Note: If you desire any additional information, we will gladly furnish the same, while our memberships last, at a cost of $1."

To those who do not respond to this letter within a reasonable time, the prospect is called on the telephone by Mr. Graham, who shapes his conversation to fit the individual case and always makes it rather casual—never stilted. He may say, for example, after stating who is calling:

"We recently sent you a letter referring to a membership in the Thrift Savings Club. Did you receive it, Mr. Jones?"

If the prospect indicates that he received and read the letter he is then told:

"I have reserved a membership for you, but naturally wanted your confirmation before making it effective."

That this telephone follow-up proves effective is seen by the fact that a series of such calls, occupying one hour and twelve minutes, in one brought in sixteen orders for reservations of membership books.

Those who were sent the first letter without responding and who cannot be reached by telephone are sent a form letter, which reads:

"Dear Owner:

"Recently I sent you a letter regarding a membership in the Thrift Savings Club.

"You will, no doubt, recall that some of the privileges and benefits of a club membership were as follows:

(Service and discount items here repeated, as in first letter.)

"The number of our remaining memberships open to..... owners is now very limited. Therefore, we suggest that you reserve yours immediately by phoning Poplar 2900, or by calling at our service station, the club official station, 21st and Hamilton Streets."

The third form letter is used where a membership has been ordered and reserved, but the book not called for and the dues not paid, within two days. It reads:

"Dear Mr. .....

"It is a pleasure to add your name to the membership roll of the Thrift Savings Club.

"I suggest that you call at our official service station, 21st and Hamilton Streets, for your membership card and service book. I have them in my files, awaiting you.

"However, if you prefer me to mail your card and book to you, I will be glad to do so upon receipt of your check for $1, the amount of the dues.

"EDWARD M. GRAHAM,
"For Thrift Savings Club."

The postcard, which bears in bold type the words "Last Mail Call," as a heading, tells the prospect that this is the last time he will be written to about the Thrift Savings Club membership, but that as there are now only a few memberships left, the suggestion is made he secure his without delay.

A fourth form letter is used where a membership has been ordered, and paid for, by mail. Here it is:

"I thank you for your check covering membership in the Thrift Savings Club.

"I am enclosing your Membership Service Book No. . . . with membership card attached . . . Use it freely . . . It will mean many, many dollars of service savings to you.

"I look forward to greeting you here at our official service station, 21st and Hamilton Streets.

"EDWARD W. GRAHAM,
"For Thrift Savings Club."

CHEK-CHART PROVIDES SALES TRAINING FILM

Raymond Shaw, president of the Chek-Chart Corporation, Chicago, has announced that a moving picture film demonstrating correct methods of selling and applying lubrication service is to be produced under its supervision by Trade-Ways, Inc., New York. Distribution will be made on a co-operative basis to oil companies, jobbers and others for use in training service station attendants.

The film can be had in either thirty-five or sixteen millimeter and the job will be a strictly professional product throughout, using animated films for explaining the working and operation of various lubrication points and using real actors and real directors in the portrayal of the merchandising and application angle. The film will be accompanied by a complete instruction manual so that any supervisor or executive without previous study can take the film out to groups of men and secure maximum training results and profits.

SHARP EMPLOYMENT GAIN IN AUTOMOTIVE INDUSTRY FOR NOV.

(Continued from Page 1)

the larger Michigan automobile centers. At Flint thousands of employees were recalled to the major automobile concerns, a spark plug establishment and automobile body factories. At Bay City 250 former workers were recalled by an automobile factory and a hoist manufacturing concern. About 750 former employees of Lansing automobile factories were ordered to report back for work early in December. Not so cheerful was the news from Kalamazoo, where a taxicab factory was reported closed.

Departmental overtime was reported in an automobile accessory plant at Anderson, Ind.

But employment in automobile and automobile accessory plants in Iowa did not show so favorable a trend, a slight falling off being noticeable.

Somewhat increased activities were noted in the automobile assembling plants of St. Louis, with small additions to the forces now employed.

Although activities in the automotive industry in Ohio continued below normal, several accessory concerns reported some improvement in business and employment. Full time operation was reported by several accessory plants in the Cleveland district. Improvement was also registered by accessory plants in the Columbus district, although an automobile assembling plant in the district closed down, releasing 250 men. The tire and tube industry in the Akron district continued sluggish, although close to normal operations obtained in the rubber-products industries in the Sandusky district.

VIRGIL JORDAN HEADS CONFERENCE BOARD

(Continued from Page 1)

with the McGraw-Hill Publishing Company. As economic adviser to the McGraw-Hill Company, in connection with its thirty-five business publications, reaching into the major branches of American industry, Mr. Jordan brings to the board an extended knowledge of industrial conditions and a close acquaintance with industrial executives in every field.

The Hon. Alanson B. Houghton, formerly ambassador to Germany and to Great Britain, is chairman of the board, and its executive committee includes W. C. Dickerman, president American Locomotive Company; Irenee du Pont, of E. I. du Pont de Nemours & Co.; Howard Heinz, president H. J. Heinz Company; Thomas J. Watson, president International Business Machines Corporation; Fred I. Kent, director Bankers Trust Company; Edwin Gruhl, president the North American Company; R. C. Holmes, president the Texas Company; David L. Luke, president West Virginia Pulp and Paper Company; R. E. Tomlinson, chairman National Biscuit Company; Charles Cheney, chairman Cheney Brothers; Loyall A. Osborne, president Westinghouse Electric International Company; Herbert F. Perkins, director International Harvester Company, and Malcolm B. Stone, treasurer Ludlow Manufacturing Associates.

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Used Car Selling Prices

Automotive Daily News in this department offers for the benefit of its dealer and salesmen readers a compilation of prices at which used cars have within the past few days been offered for sale by reputable dealers in various cities. These prices will vary on condition and from other causes. They are not presented as being the exact prices at which these models should be sold, but simply as the prices at which they have been offered for sale by dealers in the various cities. Other cities will appear in subsequent issues of this paper.

Houston, Tex.

Make	1932	1931	1930	1929
Buick, light	.....	.....	[2]295- 495	[3]175-[2]195
Buick, big	[3]845- 1095	545	.....	.....
Cadillac	.....	.....	.....	[2]750
Chevrolet	[1]475-[1]495	[3]365- 385	195-[2]295	[1]155- 225
Chrysler	995	.....	.....	395
De Soto	.....	.....	315	295
Dodge Six	.....	[2]485	345-[3]415	315
Dodge Eight	.....	.....	[2]395	.....
Essex	545	.....	.....	100
Ford Four	.....	[2]265-[1]285	[3]175-[1]250	100-[1]190
Ford Eight	[1]525-[2]625	.....	.....	.....
Graham Six	.....	375	225- 295	.....
Hudson	.....	.....	.....	165
Hupmobile	.....	[2]425	365	395
Marmon	.....	.....	.....	250
Nash	.....	.....	.....	145- 235
Pontiac	[1]365	.....	.....	[1]195
Plymouth	[1]345- 395	.....	.....	[1]100- 165
Studebaker Six	.....	.....	285	.....
Studebaker Eight	.....	.....	[2]395	245
Willys Six	.....	.....	245	[3]150

Legend: [1]coach; [2]coupe; [3]roadster; [4]convertible; [5]victoria; [6]limousine; [7]brougham; [8]touring or phaeton. When no symbol is used the car is a sedan.

Dealer Activities

CONNECTICUT

Ira M. Thompson, one of Connecticut's pioneer automobile dealers, retired from business just before the holidays with the liquidation of the Thompson Buick Company, 70 Elizabeth St., Derby. Mr. Thompson entered the business in 1910 and is said to have sold the first automobile in Derby. The company, in which Mr. Thompson's two sons, Capt. H. A. Thompson of Derby and P. Russell Thompson of New York city, were also members, was incorporated in 1930.

* * *

The Sales and Service Managing Company has been incorporated in Waterbury by Fred Emmons and Roland S. Hotchkiss. Mr. Emmons was until recently the Oldsmobile dealer in Waterbury and for some time conducted F. A. Emmons' Super-Service, Inc., 398 West Main St. The super-service business was taken over last July by Waterbury Automobile Servic , Inc., with Mr. Hotchkiss, who is treasurer of the Hotchkiss Motor Company, as treasurer and manager. The firm has been handling all Buick service for the Hotchkiss company, and general service as well.

* * *

Adams & Wolfe, Inc., automobile dealership recently chartered in Norwich, has filed an amendment to its certificate of incorporation stating that paid-in capital at start of business is $5,000 instead of $10,000.

* * *

The Dealers' Automobile Exchange, Inc., has been formed in New Haven, with authorized capital of $50,000. Incorporators are T. Holmes Bracken, Meyer Meyers and Matty N. Nuzzo.

* * *

Harry A. Allen, vice-president of the Harrington Hudson Company, Hartford; the Taber Cadillac Corporation, Hartford, and J. S. Harrington, Inc., Springfield, Mass., died recently after a month's illness. He was widely known as a banker and looked after the financial interests of the three automobile dealerships with which he was connected.

* * *

MILWAUKEE, WIS.

Studebaker-Rockne Sales, Inc., has been named distributors for Studebaker automobiles in Milwaukee and eleven surrounding counties. John G. Wollaeger is head of the new distributing agency, and A. W. Marcy, who has been connected with Keller Brothers & Marcy, Studebaker dealers in Pasadena, Cal., is vice-president and general sales manager of the firm.

* * *

Announcement is made by A. W. Marcy, vice-president and general manager of the Studebaker-Rockne Sales Company, of the appointment of the Ross Johnson Auto Sales as an authorized Studebaker and Rockne dealer. Mr. Johnson, president of the firm bearing his name, has been connected with the automotive business in Milwaukee for the last nine years.

* * *

INDIANAPOLIS

Appointment of C. J. Underwood as sales promotion manager of the Hoosier Motor Club is announced by Todd Stoops, secretary-manager. Mr. Underwood has been connected with A. A. A. motor club work in the state for nearly ten years, and in his new connection will co-operate in the promotion of safety work and legislation favorable to the motorist.

* * *

AKRON, O.

Al Greenwald has announced the appointment of the De Witt Motor Sales, North Main Street, as subdealers for the new Plymouth six and Dodge six motor cars. J. E. De Witt is president of the organization. Mr. De Witt has named George Coon in charge of sales of the new cars. Mr. Coon has been connected with the automobile trade many years.

* * *

BARNESVILLE, O.

Appointment of Clyde H. Martin as general manager of the Michael Chevrolet Company has been announced. Mr. Martin recently returned from Philadelphia, where he had been assistant manager of the Oldsmobile distribution plant for four years. He had also been identified for several years with the General Motors Company.

* * *

CUDAHY, WIS.

The Edward Motors Company, Milwaukee, has announced the appointment of Carl Venus as local dealer for Dodge and Plymouth automobiles. Mr. Venus will continue to handle the Studebaker and Rockne line, as heretofore.

Automotive Daily News

"Of, By and For the Entire Automotive Industry"

Published Every Day Except Sunday, Monday and Holidays, and Tuesday When a Holiday Falls on Monday

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B. B. Crighton, Assistant to Business Manager.
George M. Slocum, Manager, Detroit Bureau, 427 Fisher Building, Detroit, Mich.; phone Trinity 2-3500. Willard R. Cotton Western Manager, 383 North Michigan Ave., Chicago, Ill.; phone Andover 2400. Metz B. Hayes, New England Manager, Little Building, Boston, Mass. Blanchard, Nichols & Coleman, American National Bank Building, San Francisco, Cal.; Lincoln Building, Los Angeles, Cal.; 1037 Henry Building, Seattle, Wash.
Address ALL Advertising and business correspondence to 350 Hudson St., New York city.

EDITORIAL DEPARTMENT

350 Hudson St., New York, N. Y. Telephone CA nal 6-1000.
Alexander Johnston, Editor. William C. Callahan, News Editor.
Statistical Department (registrations and specifications), P. J. Robas, statistician. Engineering Department, A. Benson Carleton, technical editor. Merchandising Department, Charles S. Zack, editor. Art Department, John Bauerfeld, director.
Detroit Bureau, Chris Sinsabaugh, editor, 427-8 Fisher Building, Detroit, Mich. Telephone Trinity 2-8500. Contributing editor, John C. Wetmore.

The Tail Wags the Dog

AUTOMOTIVE DAILY NEWS has called attention more than once to the tremendous contribution which the automotive industry makes to allied and subsidiary business activities. Every car bought in this country contributes wages and profits to allied industries, from the retail store back through the manufacturing plant to the mine or field which produces raw materials.

As a matter of fact, this contribution is so vast that actually in amount of business done, our allied industries far surpass the parent activity. In a sense the tail of the automotive industry is wagging the dog, the tail being the materials, parts, accessory and service divisions and the vehicle manufacturing group the dog. The money spent for materials, parts equipment and servicing during the year far outstrips the sum invested in new motor vehicles.

It is this condition that makes the motor vehicle manufacuring industry such a vital part in our economic system as a whole. To create business indirectly to the amount of eight or ten billion dollars is a considerable achievement and contribution. It is the more remarkable when we remember that the wholesale value of motor vehicle production in 1931 was about $1,426,000,000.

We do not know of any other industry which has created so much indirect, subsidiary business as our own vehicle building industry has done. The railroad business is one of the leaders in our industrial system, but all the money spent by all the railways for equipment and materials of every kind does not equal the income of the parent business. The telegraph and telephone industry is a gigantic one, but the vast bulk of its contribution to national wealth is in the income of the operating companies themselves, not in suppliers or equipment producers. The radio business has grown rapidly in the last few years, but the manufacturers of radio sets show a far greater volume of income than do their parts makers or servicers.

There is one fact in connection with this tremendous subsidiary contribution by our industry to our national business volume that we must keep always in mind. Underlying automotive business in materials, parts, equipment, service and what not, there must always be the vehicle producing group. All these parts and materials are produced only because there are complete vehicles to use them. Eliminate the production of motor vehicles and the subsidiary industries wither and die over night.

It seems to us that in the current of their success, some of the parts and materials suppliers have tended to lose sigh of this fact. Because their total volume is greater than that of the vehicle manufacturers, they have gotten a rather astigmatic view of the whole situation. Because their volume wags the dog, they seem to have achieved a feeling that the dog no longer counts.

This is particularly true of an attitude that has been growing up for several years toward the national automobile shows in New York and Chicago. Where there used to be three or four hundred accessory and parts makers exhibiting there, there are now many fewer than that. Any one connected with the automotive industry must realize that the shows are among the most valuable assets that our industry has. The publicity given the new cars is reflected in sales not only at the exhibitions themselves but through the normal selling season and beyond. Many a car owner would drive his old car a year longer if it were not for the attractive force of some new model that he has seen at the show.

All our parts and materials and accessory producers must realize that every car sold through the instrumentality of a show anywhere gives them so much more business, at the same time it is bringing the vehicle manufacturer a profit.

It is all right to grow a tail that can wag the dog, but don't get the idea into your head that the dog isn't necessary just the same.

TRUCK FLEET OPERATOR USES OWN RECORD SYSTEM

By S. NELSON

The truck operation of Oppenheim & McEwen Company, wholesale grocers of Albany, N. Y., has been covered by a record system of its own development, because it was unable to locate one that wase fully adequate to its needs.

"That we are getting results is shown by the fact that we are now working under a program of economics which will eventually net a savings equal to the pay roll of the shipping office," says Walter S. McEwan, Jr.

"Under this program the yield of our truck dollar is being raised from 50 cetns to 75 cents without going outside the shipping department in making the necessary readjustments.

"These economies will come largely from the utilization of idle truck time. While some of this time was created by a change of quarters, the largest part was always available, but never before apparent.

"Our system covers the entire warehousing and shipping work, but only the truck section will be discussed. Our trucking is the usual distributor's trucking; local city and interuban work, freight house deliveries and rural trucking covering the outbound goods, the incoming goods being picked up at the freight houses, warehouses and boat docks.

"Besides our grocery business, we operate a warehouse business of selected accounts and use our equipment in this service. It is therefore necessary to account for this work. The bulk of our long distance delivery work is handled by express truck lines. It is work that was formerly handled by these lines that we are using to cut down our idle truck time.

"Our grocery work is done entirely in our main building from which all shipping is done, but our manufacturing department is housed separately. This requires that the truck time of hauling between the two buildings be recorded accurately. Also, since materials are received and stored at the main building for the coffee department it is necessary to account for both the time required to handle the finished product and also the time of serving the coffee department with the materials that are stored here.

"These two different services appear on the records as 'No. 1 Pick Up' and 'Coffee Department (Service).' There is still another service to be accounted for. That is the 'Plant Service' required to handle the loads to the dump and similar work.

"Our system is inexpensive and simple. It is estimated that an hour a day on the average will cover the requirements of the office work, and the material cost will not exceed $25 for a fleet the size of ours.

"The basis of the entire cost work is the hourly cost per unit for the service in question. This hourly cost can be determined from figures available from the bookkeeper, or it can be estimated if it is not already known. If a start is being made in using a record system, whatever cost figures are obtained will be an aid to more intelligent operation even if these figures are not extremely accurate. The attainment of accurate values will follow as a matter of routine work.

"The unit costs are determined by computing the costs of the different services and then dividing these service costs by the number of units handled. The basis, or hourly cost, will vary with the different services. Once this cost has been determined for the cheapest terirtory, the necessary increments for the other services or terirtories can be determined and applied to cover the work on other territories.

"One item frequently omitted in arriving at the hourly cost of equipment is the supervisory overhead. The main office may have no direct contact with the individual truck, but some of its work is made necessary by that truck and must be paid for by it.

"The driver's daily card is our only printed form. The make-up of this form can be best determined by the needs of the individual. Besides the necessary space for the time of the trips, the work done and the service, provision for notes to aid in the recording will aid the work materially.

"The daily record sheet is used to record the day's work of each truck. We use No. 5313 national analysis pad, ruled and lettered to cover our needs. The second section, called the volume record, is kept in a journal book. The monthly breakdown to unit costs and the showing of other truck data are all done on graph paper.

"The recording of a truck's work for a day will be followed through in outline to the final breakdown to unit costs. The first step in the actual work is to check over the driver's daily card and at the same time make the necessary allotments of the trip time to the different services. The card is ready for transfer to the daily record sheet and to the volume record. In the case of split trips where two or more services are covered, the proper allotment of the trip time portion to the individual service must be judged if it cannot be determined in any other way.

"In fact, the cost of maintaining a set of records such as are here outlined can be kept at a low figure only if certain short cuts are taken. In some matters, judgment tempered by experience will give results remarkably close to those that can be obtained only by extensive work.

"After going over the cards, the next step is to write up the daily record sheet. The headings of this form are those needed to cover the entire work as shown. The loading and unloading time is computed from rates as shown by actual tests. These rates vary with the goods handled. Having determined the loading and unloading time and noted the same on the sheet, the sum of all the time items now down on the sheet is subtracted from the time in service for the day to secure the waste or idle time.

"On days when the time as shown on the sheet exceeds the working day a credit is carried over for the

(Continued on Page 11)

P. S. TO OPERATE FIVE NEW BRIDGE BUS LINES

Hackensack, N. J., Dec. 29. — Operation of five new lines by Public Service Co-ordinated Transport through Fort Lee, linking various nearby towns with the George Washington Bridge Plaza, will be begun within the near future, it was learned recently. The lines will operate eighty-two buses, radiating from the bridge plaza into Hudson and Bergen counties.

At the same time, Public Service announced that beginning December 20 reduced fares were put into effect on the Hackensack-Westwood bus lines No. 46, and the Nyack-Englewood-New York bus line No. 158 and special round trip tickets are being sold on Hackensack-Newark bus line 102.

In addition, reduced fares have been put into effect on Hackensack-New York bus lines No. 82, Dumont-Bergenfield-New York bus line No. 86, and Closter-New York bus lines No. 84.

RECIPROCAL TRUCK LAWS TO BE DISCUSSED IN JAN.

Detroit, Mich., Dec. 29.—State officials, manufacturers and operators of motor trucks will gather in Detroit January 17-18 to study reciprocal regulatory statutes between states in an effort to remove some of the obstacles to full and unrestricted movement of truck freight over interstate highways.

The meeting will be held in conjunction with the highway and building congress. Participating bodies will include the Society of Automotive Engineers.

ACCIDENTS DECREASED

Philadelphia, Dec. 29.—A decrease in all types of motor vehicle accidents occurred in November, something not recorded for any previous month of this year, according to the division of safety, Department of Revenue. The total number of accidents dropped 21.9 per cent. last month, compared with the record of November, 1931; fatalities were 2 per cent. less; number of persons injured, 13.3 per cent. less, and property damage 22.6 per cent. less. There were 3,557 motor vehicle accidents reported in November, 201 fatalities, 3,547 persons injured and $390,000 in property damage, while the total number of accidents in November, 1931, were 4,558, fatalities 205, persons injured 4,094, and property damage $504,000.

Calendar of Coming Events

JANUARY

7-14—**New York, N. Y.** National Automobile Show, Grand Central Palace.
7-14—**San Francisco, Cal.** Motor Car Dealers Association of San Francisco seventeenth annual Pacific Automobile Show, Civic Auditorium. G. A. Wahlgren, show manager.
7-13—**Los Angeles, Cal.** Los Angeles Motor Car Dealers Association, twentieth annual show.
8-14—**St. Louis, Mo.** St. Louis Automobile Dealers Association Show. Midwest Industrial Terminal Building. J. A. Schlecht, show committee chairman.
9—**New York, N. Y.** Society of Automotive Engineers, show meeting.
9—**New York, N. Y.** Rubber Manufacturers Association. Meeting.
11—**New York, N. Y.** Society of Automotive Engineers, annual dinner, Pennsylvania Hotel.
14-21—**Toronto, Can.** National Motor Show of Canada, Automotive Building. J. L. Stewart, manager Canadian Automobile Chamber of Commerce, in charge.
14-21—**Cleveland, O.** Cleveland Autmobile Manufacturers and Dealers Association, show. Herbert Buckman, manager.
14-21—**Newark, N. J.** Newark Automobile Dealers Association, show. Armory. Claude E. Holgate, show manager.
14-21—**Milwaukee, Wis.** Milwaukee Automobile Trades, Inc., show. Palmer E. Hanson, manager.
14-21—**Buffalo, N. Y.** Buffalo Automotive Trade Association, show. Albert Hertzog, Jr., manager.
14-21—**Providence, R. I.** Rhode Island Automobile Dealers Association, show, Cranston Street Armory Ralph P. Lord, manager.
15-21—**Cincinnati, O.** Cincinnati Automobile Dealers Association, show. Music Hall. Harry T. Gardner, manager.
16-20—**Detroit, Mich.** Annual convention and road show.
16-20—**Detroit, Mich.** Highway and Building Congress.
16-21—**Brooklyn, N. Y.** Brooklyn Motor Vehicle Dealers Association, show. Ralph Ebert, manager.
16-21—**Philadelphia, Pa.** Philadelphia Automobile Trade Association, show.
16-21—**Detroit, Mich.** Steel Founders Society of America, annual meeting.
20-28—**New York, N. Y.** National Association of Engine and Boat Manufacturers, boat show, Grand Central Palace.
21-28—**Montreal, Canada.** National motor show of eastern Canada. Stadium Building. Adelstau Levesque, general manager.
21-28—**Boston, Mass.** Boston Automobile Dealers Association. Boston Commercial Motor Vehicle Association, show, Mechanics Building. Chester I Campbell, manager.
21-28—**Jersey City, N. J.** Automobile Show, Midtown Auto Salon, Frank Galland, manager.
21-28—**Baltimore, Md.** Auto Trade Association of Maryland, show. Fifth Regiment Armory. John E. Raine, manager.
21-28—**Detroit, Mich.** Detroit Automobile Dealers Association, show. H. H. Shuart, manager.
21-28—**Syracuse, N. Y.** Syracuse Automobile Dealers Association show. C. H. Hayes, manager.
2-28—**Hartford, Conn.** Hartford Automobile Dealers Association, show, State Armory. Arthur Fifoot, manager.
22-26—**Detroit, Mich.** Society of Automotive Engineers, annual meeting, Book-Cadillac.
23-28—**Rochester, N. Y.** Rochester Automobile Dealers' Association Show, Edgerton Park, A. C. Lohman, executive secretary.
23-28—**Pittsburgh, Pa.** Pittsburgh Automobile Dealers Association, show. W. N. Owings, manager.
25-28—**Harrisburg, Pa.** Harrisburg Automotive Trade Association, show, New Farm Show Building.
27-Feb. 15—**Cairo, Egypt.** International Salon.
28-Feb. 4—**Portland, Me.** Portland Automobile Dealers Association, show. Exposition Building. L. P. Borman, manager.
28-Feb. 4—**Chicago.** National Automobile Show, Coliseum.
28-Feb. 5—**Washington, D. C.** Washington Automotive Trades Association, show.
30-31—**Chicago, Ill.** National Automobile Dealers Association, convention, Medinah Athletic Club.
30-Feb. 4—**Springfield, Mass.** Automobile show.

FEBRUARY

1-11—**Indianapolis.** Twenty-second annual show, Indiana State Fair Ground.
6-11—**Ottawa, Canada.** Ottawa Automotive Trade Association, show. Coliseum, L. M. McCoy, chairman adv. committee.
6-11—**Denver, Col.** Automobile show.
7-11—**York, Pa.** York County Automobile Dealers Association, Inc., show. R. C. Keller, president.
9-11—**Springfield, Ill.** Springfield Automobile Dealers Association, show.
11-18—**Kansas City, Mo.** Kansas City Motor Car Dealers, show.

Production--Engineering--Factory

TELLS HOW LOW-PRESSURE TIRES WERE SUCCESSFULLY ADAPTED

Tore Franzen, who holds the title Easy Riding Engineer, Chrysler Corporation, took a leading part in discussion on the paper on superballoon tires presented recently by B. J. Lemon before the Cleveland section of the Society of Automotive Engineers and abstracted in these columns in December.

In his discussion Mr. Franzen indicated that many car engineers prepared as best they could for the coming of low-pressure or superballoon tires by extensive experimental work, but were handicapped by a lack of interest on the part of big equipment tire makers and by a late agreement as to rim and wheel sizes on the part of the Tire and Rim Association. This accounted in part, at least, for the "cool" reception such tires received on the part of car designers.

There still appears to be much difference of opinion as to what constitutes a superballoon tire, and those thus far adopted as standard or optional equipment have a considerably smaller section than has been proposed and tried in some instances, although they have a larger section and use somewhat lower pressure than conventional balloon tires. Wheels for this type of tire are now available from what Mr. Franzen terms "a strong source of supply," although he indicates that this was not the case until quite recently. An abstract of Mr. Franzen's discussion, including the experimental evidence which he submitted, follows:

Not until the early spring of 1932 could the car engineers afford to really warm up to the low-pressure tire, even though some laboratories had already rolled up thousands of miles on many kinds and sizes of tires and really had an excellent background for action. Their first problem was to apply the new equipment to the cars of 1931 design. The second was to design new cars with low pressure tires as standard equipment.

Before the car manufacturers could afford to recommend this new tire they had to be reasonably sure that the buyer would get an equipment which is lasting, safe, giving a better ride, better in appearance, and, in general, worth its price.

Fig. 1 shows the wear of 7.50 x 15 x 5.5 tires from a 3,100 lb. car loaded with 750 lbs. and driven at speeds of approximately fifty miles mainly over Michigan gravel roads. The mileage is 17,000 and the inflation is 18 lbs. The striking difference in wear of front and rear tires can be explained by the fact that the rear wheels carry a heavier load and that the driving torque was taken through them. The front tires are worn on the outside—this is the effect of camber and toe-in as it is now accepted on most cars using conventional balloon tires. The picture is typical of the early stages of the test of low pressure tires on 1931 design cars.

The originally recommended low inflations were responsible for some early side-wall failures. The life is increased by higher inflation and with increased pressure it is advisable to decrease size. Corrected camber and toe-in produced more even wear on front tires.

Step by step it was found out how to apply the new tires so that today a tire life very similar to that of the standard balloon tire may be anticipated. The knowledge of the art is as yet limited compared to the data available on standard balloon tires and complete scale of sizes can hardly be established yet. Experimental information indicates that a satisfactory tire size and inflation pressure for lighter car weights can safely be recommended as follows:

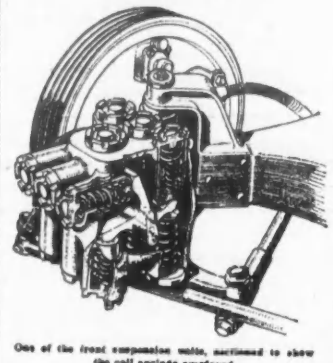
Car Weight	Tire Size	Inflation
2900	6 x16x4	25-26
3600	7½x15x5.5	20
3300	7 x15x5	22

Pressures in the low-pressure tires vary less per degree of temperature change than the pressures in the standard balloon tires.

A tempertaure change of 14 degrees Fahrenheit is necessary for an increase of one pound pressure in

(Continued on Page 8)

DUBONNET SPRING SUSPENSION



One of the front suspension units, sectioned to show the coil springs employed.

Readers of Automotive Daily News know that M. Andre Dubonnet of France is now in this country to interest manufacturers in his system of independent spring suspension. The English magazine, The Motor, in its current issue has a description of this new spring system, and a picture is reproduced herewith. The description follows:

Apart for the feature of permitting each of the four wheels to rise and fall independently, the Dubonnet system is, we think, unique in allowing the whole of the steering gear to be mounted on the chassis frame. For this reason, coupled with the fact that there are no gyroscopic effects, the movements of the wheels over road obstructions have no reaction upon the steering system, so that the steering wheel never tends to "fight" against the driver, even on the roughest surface.

Before explaining how this result is made possible, we must devote a little attention to the springing system itself, which employs coil springs acting in combination with hydraulic damping. There are four suspension units, each of which contains nine load-carrying springs acting through pistons. These pistons react through levers mounted on a shaft carried in ball bearings, and the road wheel is fitted to an arm secured to this shaft. In addition, three lighter springs are provided to take the rebound, and the pistons to which these are fitted provide the hydraulic damping action.

The levers upon which the pistons take effect are so arranged that the leverage exerted by the springs increases with the amplitude of movement. In other words, as the road wheel rises upon meeting an obstruction (or as the load is increased) the springing becomes virtually stiffened so as to prevent excessive movement and also to allow of the utmost flexibility under normal conditions.

It must be understood that the oil damping effect takes place within the small cylinders and does not produce a rise of pressure in the main casing. Consequently, no trouble with leakage need be anticipated, there being just a simple gland to retain the oil at the point where the shaft emerges.

At the front of the chassis each suspension unit is pivoted to a jaw formed on an extension of the frame and swings around the steering head when the steering gear is operated. It is for this reason that the front wheels can rise and fall on their radial arms without affecting the steering system in the slightest.

The rear suspension units are mounted on the side members of the frame and the drive to the wheels is taken through universally jointed cardan shafts from a differential casing mounted on a cross-member. Consequently, the upsprung weight both fore and aft is extremely low, consisting merely of the wheel, brake and a part of the radial arm.

We understand that this system has been demonstrated to a number of leading engineers, who have expressed themselve as impressed by its performance and possibilities. In view of the great interest which is at present being shown in the principle of springing the wheels independently, systems of this type may be expected shortly to undergo considerable development.

DISCUSS INHIBITION

Atlantic City, N. J., Dec. 29.—Scientific research has established that inhibition, the phenomenon which frees our gasoline of knocks and causes our automobile tires to be guaranteed for a lifetime, is also an important factor in the search for a means of retarding the spoilage of foods such as butter.

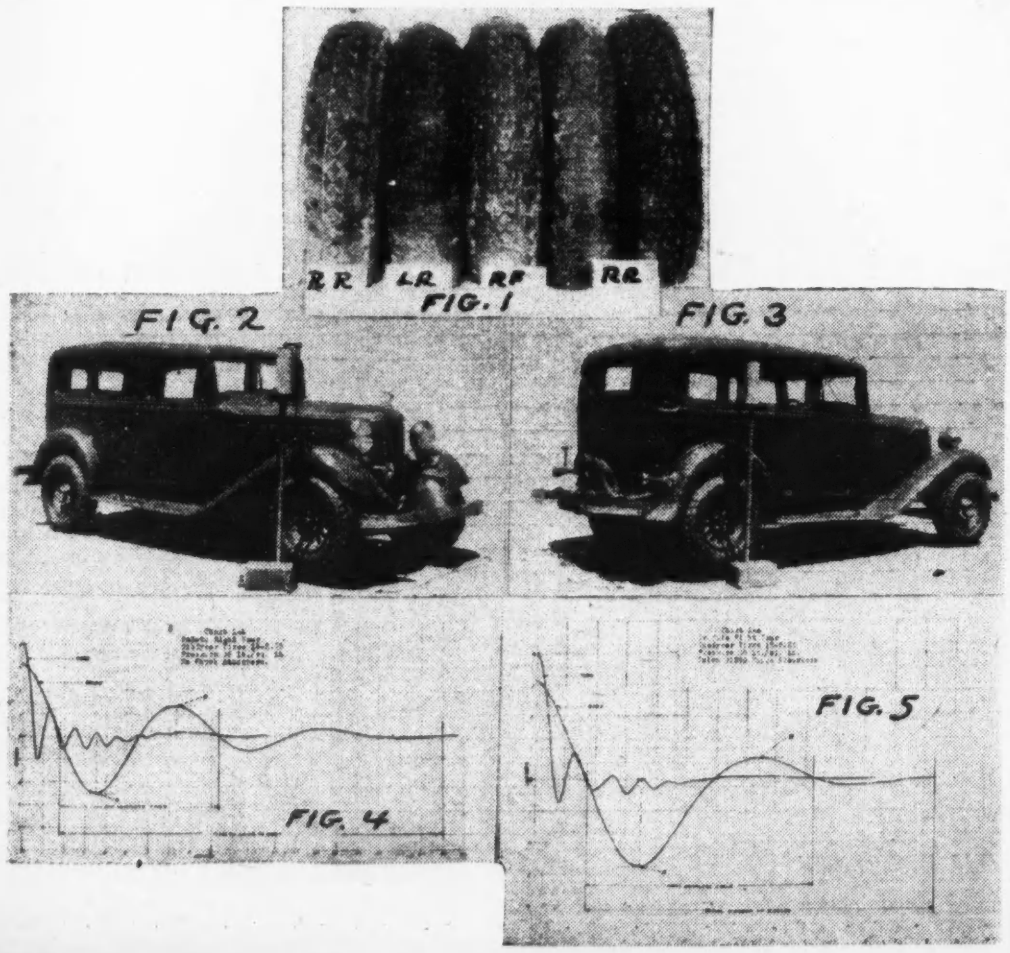
This was one of the conclusions reached by Prof. Hubert N. Alyea of Princeton and K. K. Keu in a paper on "Organic Inhibitors in Chain Reactions," which was read today before the chemistry section of the American Society for the Advancement of Science, presided over by Dr. Frank C. Whitmore, chairman of the section, and dean of the School of Chemistry and Physics of Pennsylvania State College.

The inhibitor which controls oxidation reactions, Prof. Alyea reported, is just as effective in checking polymerization — the "chemical merger" by which huge molecules are formed from simpler substances within a given body.

DR. C. L. REESE ELECTED BY CHEMICAL SOCIETY

New York, Dec. 29.—Dr. Charles L. Reese, retired chemical director of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has been elected president of the American Chemical Society for 1934, it was announced, following a meeting of the society's council.

Prof. Arthur B. Lamb of Harvard University becomes president of the society on January 1, and will serve throughout 1933, succeeding Dr. L. V. Redman.



THE bill for dirt is the biggest bill automotive owners pay today. They pay for it in decreased performance, gasoline mileage, contaminated and short-lived oil, worn cylinders, hard carbon, burned bearings and all the other ills that follow the use of dirt and dust laden air. Your engine takes in 8400 gallons of air for every gallon of gasoline... just think what it means when that air is dirty. The one sure, complete way to prevent it is to use an Air-Maze . . . and you'll save a cent or more per mile when you do it! Write for the cost facts today.

AIR-MAZE CORPORATION, *314 Caxton Bldg., Cleveland, O.*

DEALERS TRUCK OWNERS

It pays to sell Air-Maze, both in immediate profits and the friendship of your customers. This subject is becoming more vital every day—let us give you all the facts and show you profits too good to be overlooked.

The new Oil Bath Air-Maze is proving the most important cost-cutting device now available for truck and bus operators. Let us give you the definite figures and show you what Air-Maze will save on your equipment.

AIR-MAZE

Cumulative New Commercial Car Registration Statistics, November, 1932

Figures in this table are from R. L. Polk & Co. of Detroit, with the exception of Illinois, which are supplied by the Robinson Advertising Service, Springfield, Ill., and New Jersey, which are furnished by the New Jersey Motor List Co., New Car Division, Trenton, N. J. Metropolitan district figures compiled by Sherlock & Arnold are included in New York state total. Readers desiring county, city, or town lists, or lists of owners in any given section, may obtain these by addressing any of these three companies. Some of this data has been published previously, but it is given here complete for the convenience of our subscribers.

Returns for today: California, Kentucky, Maine, Nevada, New York, Oklahoma, Tennessee, Vermont

In this table, 43 states and the District of Columbia

States	Autocar	Brockway	Chevrolet	Diamond T	Dodge	Federal	Ford	G. M. C.	Indiana	International	La France Republic	Mack	Pierce-Arrow	Reo	Sterling	Stewart	Studebaker	White	Willys-Overland	Miscellaneous	Totals	States
Alabama			82		10		115	12	2	30				3			5	1		9	269	Alabama
Arkansas			40		2	1	47	1		5							1				97	Arkansas
California	4		125	2	34	1	334	29	3	26	1	2		11	2	1	11	1	2	18	607	California
Connecticut	2		55	1	9	6	93	12	2	15		7		7	1		3	4	2	5	224	Connecticut
Delaware	1		4				14	4		4						1			1		29	Delaware
Florida			56	4	5	10	79	1	2	14		1						2		16	190	Florida
Georgia			33		2		74	9		5				2						7	132	Georgia
Idaho			15		1		19			4							1				40	Idaho
Illinois			69	9	13		120	5		17		8		7			8	2	1	11	270	Illinois
Indiana			35	3	12	3	73	7	4	26				1		3	5		3	5	180	Indiana
Iowa			55	7	5		64	4		12							1				148	Iowa
Kansas			84	5	8		115	5		21				2			4	3	1	1	249	Kansas
Kentucky			30		9		81	9	1	26				1		1	4			2	164	Kentucky
Louisiana			41	3	5		62	3		8		1		2				2	1	9	137	Louisiana
Maine			33	2	11		48	1		9				4			1				109	Maine
Maryland	4	10	35	2	13		64	11	1	7				2	2		1		1	6	159	Maryland
Massachusetts	8	2	116	15	20	2	255	51	5	26	1	3	1	11		8	5	3	2	3	537	Mass'setts
Michigan			52	1	8	7	132	7		15				8			13	2		4	249	Michigan
Minnesota		2	52	11	15	1	104	10		18	1	1		6		1	10		3	4	239	Minnesota
Missouri	2		126	2	22	4	150	27	3	35				3		1	2	1	2	5	385	Missouri
Montana			14		1		17			5							1				38	Montana
Nebraska			42	4	3		36		1	15										2	103	Nebraska
Nevada			3		1		1										2				7	Nevada
New Hamp.		2	18	4	3	1	36	2		3		2					2		1		74	New Hamp.
New Jersey	2	4	77	7	32	3	155	26	5	28		7	1	11	1	4	6	43	5	10	427	New Jersey
N. Mexico			28	4	2		37			8				1							80	N. Mexico
New York	19	36	202	22	93	7	444	61	5	119		26	3	20		16	15	7	5	25	1125	New York
North Car.			49		3		109	3	3	9		1		2				4		5	188	North Car.
North Dakota			6				10	1		10										4	31	No. Dakota
Ohio	2		73	1	31	1	212	40	10	33	1	3	1	5			12	2	3	15	445	Ohio
Oklahoma			47		14		104	6	3	23		2		2			1		1	3	206	Oklahoma
Oregon			9		2	1	41	3		2		1		1					1	1	62	Oregon
Penn'vania	13	14	216	13	77	9	448	39	10	110		14	4	22	1	12	14	11	12	16	1055	Penn'vania
Rhode Island	2		7		2	1	39	5		6				9		1	1	1	1	1	76	Rhode Isl.
S. Carolina			19		4		33			4	1						1		1	1	64	So. Carolina
S. Dakota			10	3	4	1	15			5							1		1	5	45	S. Dakota
Tennessee			37		8	7	49	2	1	10		1					1				115	Tennessee
Utah			11		2		28	1		1											43	Utah
Vermont			5		4	1	31			1				2					1		45	Vermont
Virginia	1		86	15	10	5	185	10		12		2		4			4		1	2	337	Virginia
Washington			7				41	4		11		2					2	1	1	5	74	Washington
W. Virginia	2		21	1	3	1	57	6	3	10				4			2			2	112	W. Virginia
Wisconsin			70	4	7	2	61	5		28		1		1	1		8		2	5	195	Wisconsin
Dist. of Col.		1	20	1	3		41	6		20		1								5	98	Dist. of Col.
Totals	62	71	2215	146	513	75	4273	428	64	796	5	86	10	154	8	49	147	90	55	212	9459	Totals
Alabama, 1931			167	1	11	5	76	13		91	3	2		8	1		5	4	3	4	394	Alabama, '31
Arkansas, '31		1	51		1		43	1		9									1		107	Arkansas, '31
California, '31	4	3	267	5	62	2	537	31		27	3	6		23	9	3	17	7	10	52	1068	Cal., 1931
Conn., 1931	3	1	96	4	28	16	129	24		24	5	14		20	1	4	7	7	3	10	396	Conn., '31
Delaware, 1931	2		9		1		15	1						1						2	31	Delaware, '31
Florida, 1931			136		3		125	2		7				7				1	2	2	285	Florida, 1931
Georgia, 1931	1	1	99				93	8		9				4				1	2	1	219	Georgia, '31
Idaho, 1931			25		5		31			1				2					1		65	Idaho, 1931
Illinois, '31	4		171	22	16	4	197	41		43		1		9	3	1		3	4	17	536	Illinois, '31
Indiana, '31		4	67	3	8		80	9		12				2		3	5	2	5	3	203	Indiana, '31
Iowa, 1931			136		11		107	3		20		2		7			5		5	4	300	Iowa, '31
Kansas, 1931			66	4	6		108	2		9				1			4	1		1	202	Kansas, '31
Kentucky, '31		3	110	4	12	3	75	11		24				7		1	4	10		1	265	Kentucky, '31
Louisiana, '31			85	1	4	1	104	5		24				1			1	2	1		229	Louisiana, '31
Maine			49	2	13	1	56	1		8				3			6		1		140	Maine
Maryland, '31	6	2	75	5	14	3	115	8		15	2	10		9			2	3	1	5	275	Maryland, '31
Mass., 1931	19	6	166	4	43	6	313	50		41		10		24	4	1	10	9	1	28	735	Mass., '31
Michigan, '31			150	2	18	4	265	20		37	1	1	2	21			11		2	9	543	Mich., '31
Minnesota, '31			135	9	13	2	135	5		38	2	2		13		1	7	4	6	3	375	Minn., '31
Missouri, '31			171	5	22	10	205	17		34				6			6	2	2	18	498	Missouri, '31
Montana, '31			20		1		28	1		3				4			1	1	1		60	Montana, '31
Nebraska, '31			65		2		62	5		26				6			2	3	2	1	174	Nebraska, '31
Nevada, 1931			4		1		11			1				3						1	21	Nevada, 1931
N. Hamp., '31			27	4	1	1	39	2		5	1	2		2			1		1		86	N. Hamp., '31
N. Jersey, '31	2	5	172	3	31	8	241	65		36	1	10	3	31	1	5	4	7	5	20	650	N. Jersey, '31
N. Mexico, '31			41		3		29	1		4										1	79	N. Mex., '31
New York, '31	13	28	429	38	129	9	723	93		134	7	49	4	71	17	42	19	23	16	46	1890	New York, '31
N. Car., '31	1		142	6	10	1	166	20		9		2		3			1		2	109	472	N. Car., '31
N. Dakota, '31			6		3		19	1		8									2		39	N. Dak., '31
Ohio, 1931	6	2	159	2	34	1	257	35		58		3		24	1	2	11	20	2	19	636	Ohio, 1931
Oklahoma		1	98		3	1	83	8		8				3				1		1	207	Oklahoma
Oregon, '31			46		4	1	69	3		4		1		1			3			4	136	Oregon, '31
Pen'vania, '31	14	11	363	11	101	7	591	43		109	5	23		36	8	18	26	30	20	41	1457	Pa., '31
Rhode Isl., '31	2		23	2	7	3	65	6		6	1	1		10		1	2			1	130	Rh. Isl., '31
S. Ca'lina, '31			72		8		53	5		5		1		1			3			2	150	S. Ca'lina, '31
S. Dakota, '31			27	2	6		24			8							2				69	S. Dakota, '31
Tennessee			92		7	7	57	4		12		1		2			4	2	2	1	191	Tennessee
Utah, 1931			24		1		30	5		7				2			2				71	Utah, 1931
Vermont, 1931			17		6		18	3		4				6					2		56	Vermont, '31
Virginia, 1931	1	1	158		17	5	117	16		10	3	2		8				2		24	364	Virginia, '31
Wash'ton, '31			19		4		36	3		9				1			5	2	1	6	86	Wash., '31
W. Virginia, '31			45	4	9		47	8		12				7			5		5	5	147	W. Vir., '31
Wisconsin, '31			108	9	11	3	101	8		16		1		10	1		4		6	12	290	Wis., 1931
D. of Col., '31	17	1	39	3	5	1	80	22		20				1		1	2	7		42	241	D. of Col., '31
Totals	95	70	4427	155	695	105	5755	609	*	937	34	144	9	400	46	83	187	154	117	496	14568	Totals

1st IN VEHICLE LINEAGE

Automotive Daily News will publish more vehicle advertising lineage in 1932 than any other automotive paper.

THIS YEAR marks another in which Automotive Daily News has led all automotive papers in vehicle lineage.

At the end of eleven months Automotive Daily News ran a total of 172,238 lines of passenger car advertising alone.

Passenger car and truck manufacturers taken together used more lineage in Automotive Daily News this year and last year than they did in any other paper—a mark of confidence born of results.

Advertisers have found that the high-grade dealers who pay $12 a year for Automotive Daily News represent the backbone of the industry. As an executive paper Automotive Daily News is supreme, being read by the leading men in all important factories.

No matter what you manufacture, if it must be sold to manufacturers, dealers or others, get the facts about the only paper in the industry in which all ads are visible, that has seven readers per copy, and that has many other advantages from an advertising standpoint.

SHOW ISSUES

NEW YORK SHOW ISSUES
January 7-9-10-11-12-13

Six Issues at Each Show
Total distribution for each show week, 165,000
ALL TRADE

CHICAGO SHOW ISSUES
January 28-30-31—February 1-2-3

TELLS HOW LOW-PRESSURE TIRES WERE SUCCESSFULLY ADAPTED

(Continued from Page 5)

6x16-inch tire, while the 7.5x15-inch tire requires a temperature change of 17 degrees Fahrenheit for the same pressure change. On account of greater flexing, the low-pressure tires are subjected to a greater temperature change as a result of internal friction of the carcus; moreover, a change in pressure in the low pressure tires affects riding qualities and tire life to a greater extent than a corresponding change in standard balloon tires.

Under the subject of safety it is well to consider not only the effect of tire failure, but also such hazards as wander, tramp and shimmy. Wander is caused by several conditions. One of them is under-inflated tires. It was, therefore, reasonable to expect wander with low pressure tires. It was present in the early installations, but is now nearly eliminated by increased caster angle of king pin, more reversible steering gears, and increased freedom of all steering joints and bearings.

Tramp shows up with low pressure tires with less out-of-balance than with conventional balloon tires, and it is necessary to do a good job of balancing the wheel and tire assembly. Tramp is not materially decreased by an increase of inflation, unless pressures equal to those recommended for similar size standard balloon tires are reached.

Shimmy, while closely related to tramp, is also a function of the steering system. With an efficient kick shackle in the suspension or a cross-steering arrangement, it has been possible to practically eliminate the hazard of shimmy. At a critical speed of a car there might be a monetary flutter, but no sustained oscillation.

Parking is more difficult with low pressure tires than it is with conventional tire equipment. To make parking easier, it is desirable to increase the steering gear efficiency rather than to increase the ratio. This is to avoid unpleasant high speed conditions common to high-gear ratios.

Riding quality is as yet a highly abstract subject and dependent on many functions other than those of tires. Up to date there is no measuring stick available for riding quality and it is necessary to be satisfied with opinions. The consensus of opinion is that low pressure tires give increased comfort. Some of this comfort comes from the elimination of high frequency oscillations which manifest themselves as body noises and rattles.

To form an idea of how the suspension members behave, reference may be made to time displacement curves. Figs. 2 and 3 show instrument setups to obtain body and tire oscillating curves. The axle is lifted with a hydraulic jack and tripped electrically from the instrument.

Fig. 4 gives the characteristics of a 5.25x18 tire inflated to thirty-five pounds, together with a rear suspension on a conventional 3,100-pound car. This chart is taken without shock absorbers.

Fig. 5 shows the same story with shock absorbers. The effect of shock absorbers is clearly visible.

Fig. 6 gives the functions of the front suspension on the same car. The tire is the same size referred to in Figs. 4 and 5, but is inflated to forty pounds.

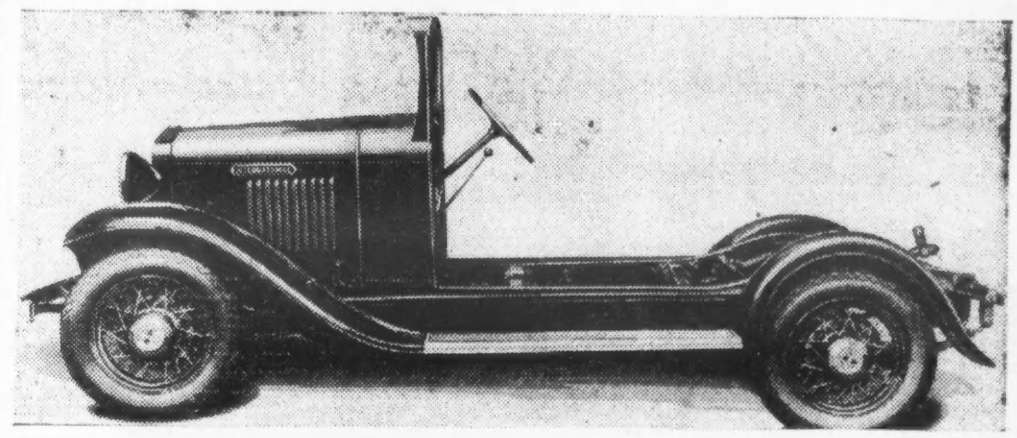
There are visible synchronizations of tire and spring frequencies, which manifect themselves as harshness.

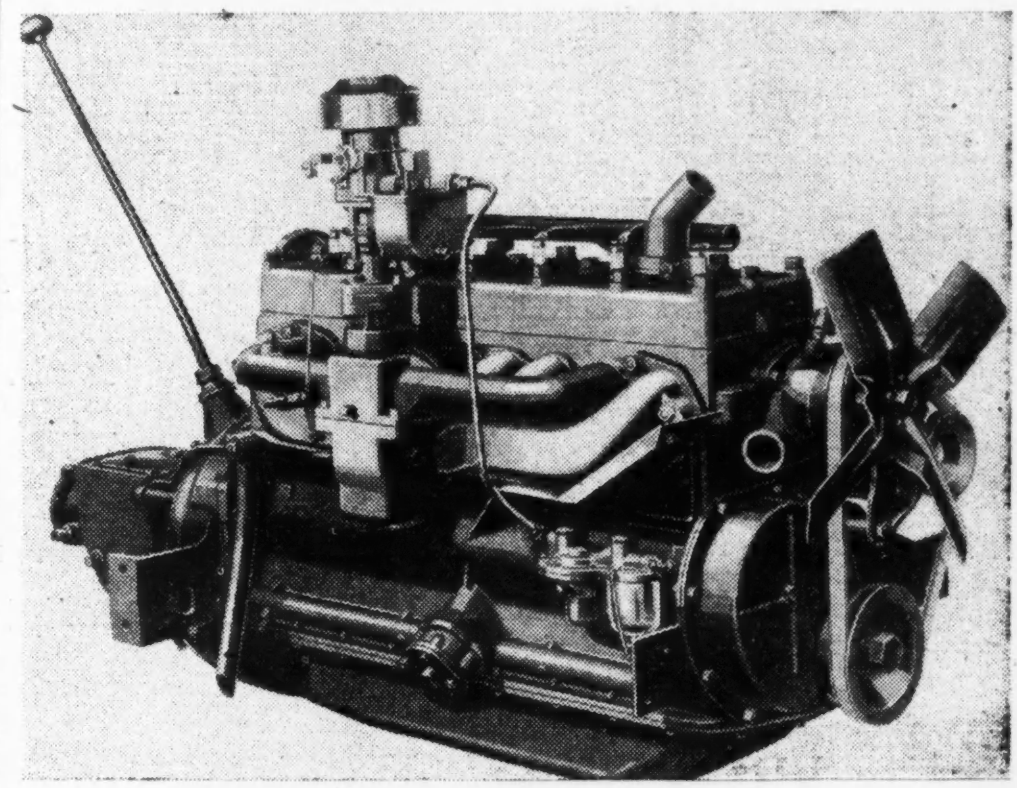
Fig. 7 illustrates the Goodyear 7.50x15-inch tires with 16 pounds pressure with shock absorber control. The tire cycles are distorted by the spring cycles; the tires in turn interfere with the spring cycle, which is more noticeable after the initial body cycle. The neutral axis of the tire cycle curve has a tendency to follow the spring curve. As the amplitude of the natural tire cycles approaches zero, the tires then tend to follow the spring motion, but with a slight lag.

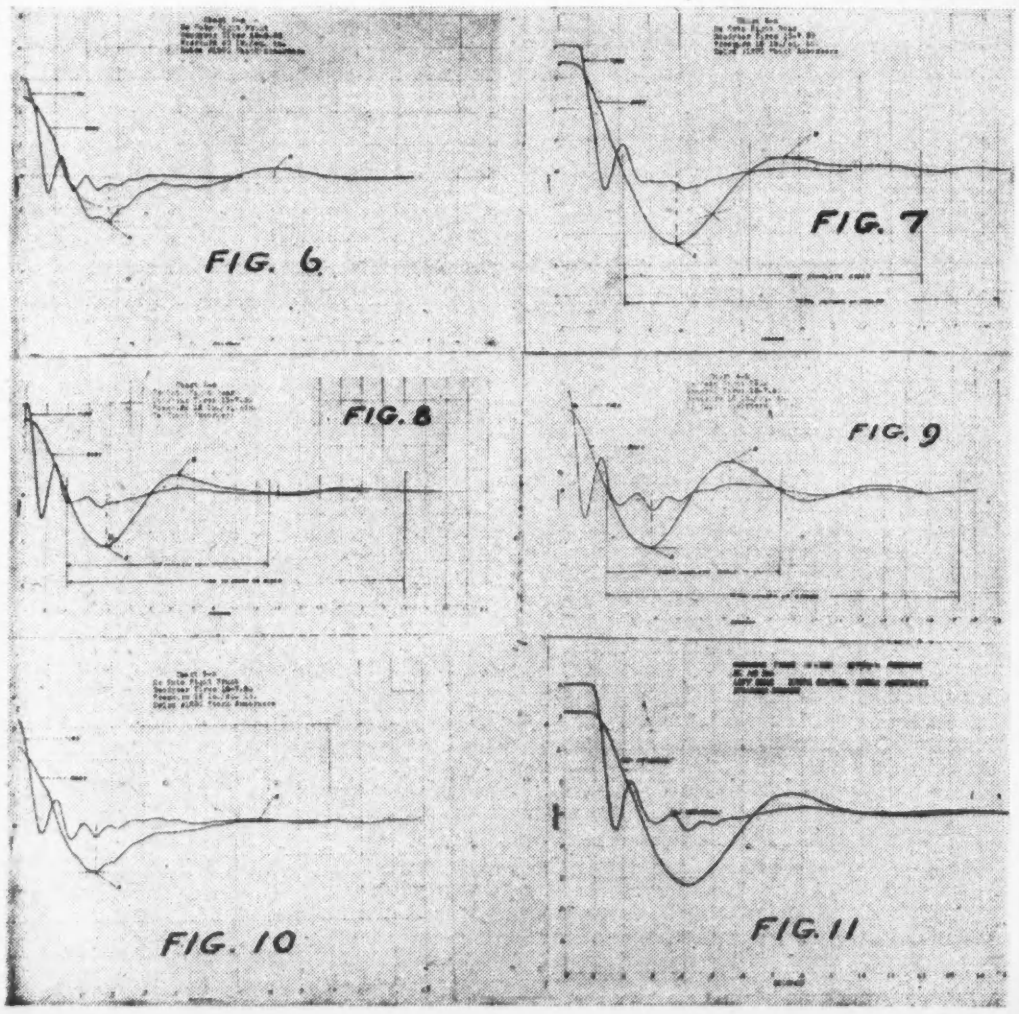
Fig. 8 shows the same combination without shock absorbers.

Fig. 9 illustrates the results of a set-up identical to that of Fig. 8, but with General 15.x7.50 inch tires inflated to 12 pounds pressure. The Jumbo tire, having stiffer side walls and narrower treads, is affected to a lesser extent by the spring during its first three cycles.

(To be Continued)







PLANT RESUMES

Bradford, Pa., Dec. 29.—The Sergeant Wire Glass Company will resume production at its plant in Sergeant, Pa., January 14, furnishing steady employment to more than fifty men.

Harvester Announces New Half-Ton Truck at $360

(Continued from Page 1)

body in coupe-type cab. The loading compartment of the panel body is 72 inches long, 46¾ inches wide, and 47 inches high. The pick-up body has a loading space 66 inches long and 46¾ inches wide. Side panels are 11 inches high, with 6-inch flare boards.

The D-1 line of trucks will be serviced through the International chain of company owned service stations and branch houses. Farmers and retail merchants in small towns will appreciate the existence of adequate service facilities.

CRUDE OIL OUTPUT AND IMPORTS OFF

(Continued from Page 1)

91,714 barrels, compared with a daily average of 114,036 barrels for the last four weeks.

Receipts of California oil at Atlantic and Gulf ports totaled 234,000 barrels for the week, a daily average of 33,429 barrels, compared with a daily average of 40,000 barrels for the last four weeks.

Owing to delay in receiving reports from various centers, the institute's compilation on gasoline stocks and refiners' operations was not available last night. It will be issued today.

TRUCK DRIVERS' WAGE RATE SCALED DOWN

San Francisco, Cal., Dec. 29 (UTPS).—Under a recent ruling of the Impartial Wage Board, effective January 1, 1933, the new wage scale for automobile truck drivers shows a reduction of about 20 per cent.,

GENERAL MOTORS WILL MAKE SPECIAL EXHIBIT AT WALDORF NEXT WEEK

(Continued from Page 1)

tion will include a novel demonstration of the new system of no-draft ventilation. This will be in addition to the division's closed and open bodies for 1933, on the several General Motors chassis.

Research will be represented by several demonstrations of unusual physical phenomena, which furnish examples of how modern research relates its findings to the practical side of life.

TO AWARD PERKIN MEDAL ON JAN. 6

George Oenslager of Akron, O., whose researches are said to have revolutionized the rubber industry and saved hundreds of millions of dollars to consumers annually, will be presented with the 1933 Perkin Medal of the Society of Chemical Industry at a national gathering of the chemical societies on the evening of January 6 at the Electrical Institute Auditorium, Grand Central Palace.

The award goes to Mr. Oenslager as "the American scientist who has most distinguished himself by his services in applied chemistry." Other organizations participating in the event are the American Chemical Society, the American Electrochemical Society, the American Institute of Chemial Engineers and the American section of the Societe de Chimie Industrielle.

Major Specifications and Mechanical Details of 1932 Commercial Cars

LEADING MAKES NATIONALLY DISTRIBUTED

Make and Model	Capacity—Tons or Lbs.	Chassis Price	Engine	Valve Arr'g'm't	No. of Cyls.	Bore and Stroke	Piston Disp.	Tax H. P.	Max. Brake H. P. and Peak R. P. M.	Type Camshaft Drive	Radiator Make	Clutch Make	Universals Make	Steering Gear Make	Carburetor Make	Fuel Feed Type	Make Electr'l System	Make Transmission	No. Spds. For.	Rear Axle Make	Type Final Drive	Final Gear Reduction	Type Service Brakes	Area Service Brake Lining	Standard Wheel Base	Chassis Wgt.	Standard Tire Sizes Front	Standard Tire Sizes Rear
Austin	400	225	Own	L	4	2.2x3	45.6	7.8	13@3200	G	Hex	Rock	Spic	Own	Til	Gra	Aut	W-G	3	Sal	Sp	5.25	O4M	76.5	75	——	18x3.75	18x3.75
Autocar E	1½	2250	Own	L	6	3¾x4¾	314.0	33.7	75@2400	G	G & O	Br-L	Spic	Ross	Str	P	DR	Br-L	4	Own	Sp	33.5	LO4IHM	380	159	5370	20x7.00	20x7.00D
Autocar RE	2	2300	Own	L	6	3¾x4¾	314.0	33.7	75@2400	G	G & O	Br-L	Spic	Ross	Str	P	DR	Br-L	4	Own	Sp	33.5	LO4IHM	380	159	5400	20x7.50	20x7.50D
Autocar RF	2	2450	Own	L	6	3¾x4¾	314.0	33.7	75@2400	G	G & O	Br-L	Spic	Ross	Str	P	DR	Own	4	Own	Sp	33.0	LO4IHM	380	159	5430	20x8.25	20x8.25D
Autocar RG	2½	2600	Own	L	6	3¾x4¾	314.0	33.7	75@2400	G	G & O	Br-L	Spic	Ross	Str	P	DR	Own	4	Own	2R	39.3	LO4IHM	460	159	6300	34x7	34x7D
Autocar A	2½	3000	Own	L	6	4 x4¾	358.0	38.4	84@2500	G	G & O	Long	Spic	Ross	Str	P	DR	Own	4	Own	Sp	33.0	LO4IV	460	150	6350	20x8.25	20x8.25D
Autocar D	3	3500	Own	L	6	4 x4¾	358.0	38.4	84@2500	G	G & O	Long	Spic	Ross	Str	P	DR	Own	4	Own	2R	39.3	LO4IV	460	150	6375	34x7	34x7D
Autocar DE	3½	3850	Own	L	6	4 x4¾	358.0	38.4	84@2500	G	G & O	Long	Spic	Ross	Str	P	DR	Own	4	Own	2R	40.7	LO4IV	519	150	6890	20x9.00	20x9.00D
Autocar DF	3½	3950	Own	L	6	4 x4¾	358.0	38.4	84@2500	G	G & O	Long	Spic	Ross	Str	P	DR	Own	4	Own	2R	40.7	LO4IV	519	150	7220	20x9.00	20x9.00D
Autocar DH	4	4150	Own	L	6	4 x4¾	358.0	38.4	84@2500	G	G & O	Long	Spic	Ross	Str	P	DR	Own	4	Own	2R	54.3	LO4IV	519	150	7450	36x8	36x8D
Autocar N	4	4600	Own	L	6	4½x4¾	404.0	43.4	94@2500	G	G & O	Long	Spic	Ross	Str	P	DR	Own	5	Own	2R	45.6	LO4IV	519	191½	7990	20x9.75	20x9.75D
Autocar NE	5	4725	Own	L	6	4½x4¾	404.0	43.4	94@2500	G	G & O	Long	Spic	Ross	Str	P	DR	Own	5	Own	2R	50.1	LO4IV	519	149	8300	22x9.75	22x9.75D
Autocar NF	5	4800	Own	L	6	4½x4¾	404.0	43.4	94@2500	G	G & O	Long	Spic	Ross	Str	P	DR	Own	5	Own	2R	42.1	LO4IV	519	191½	8350	22x9.75	22x9.75D
Autocar NH	5	4925	Own	L	6	4½x4¾	404.0	43.4	94@2500	G	G & O	Long	Spic	Ross	Str	P	DR	Own	5	Own	2R	50.1	LO4IV	519	149	8350	22x9.75	22x9.75D
Autocar S	5	5500	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	G & O	Long	Spic	Ross	Str	P	DR	Own	4	Own	2R	54.0	LO4IV	544	158	8700	22x9.75	22x9.75D
Autocar SE	6	5800	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	G & O	Long	Spic	Ross	Str	P	DR	Own	4	Own	2R	54.0	LO4IV	544	158	8850	22x10.50	22x10.50D
Autocar C	7½	6600	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	G & O	Long	Spic	Ross	Str	P	DR	Br-L	12	Wis	2R	120.5	LO4IV	664	158	10950	24x10.50	24x10.50D
Autocar CF	7½	6900	Wak	L	6	5 x5¾	677.0	60.0	126@1800	G	Own	Br-L	Spic	Ross	Str	P	DR	Br-L	12	Wis	2R	120.5	LO4IV	664	164	11280	24x10.50	24x10.50D
Autocar T	7½	6000	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	G & O	Long	Spic	Ross	Str	P	DR	Own	12	Own	2R	88.5	O4IA	544	192	9700	22x10.50	22x10.50D
Autocar TE	8½	6500	Own	L	6	4½x4¾	453.0	48.6	101@2400	G	G & O	Long	Spic	Ross	Str	P	DR	Br-L	12	Own	2R	87.6	O4IA	660	192	10700	24x10.50	24x10.50D
Autocar TF	8½	6800	Wak	L	6	5 x5¾	677.0	60.0	126@1800	G	G & O	Br-L	Spic	Ross	Str	P	DR	Br-L	12	Own	2R	87.6	O4IA	660	195	10950	24x10.50	24x10.50D
*Autocar FE	20	9500	Ste	L	6	5¼x6	780.0	66.2	156@1800	G	G & O	Br-L	Spic	Ross	Zen	P	NE	Br-L	12	Wis	2R	96.0	T4IA	664	180	12300	24x10.50	24x10.50D
**Autocar 6GE	15	11000	Ste	L	6	5¼x6	780.0	66.2	156@1800	G	G & O	Br-L	Spic	Ross	Zen	P	NE	Br-L	12	Tim	Wo	99.6	T6IA	718	198	16300	22x9.75	22x9.75D
***Autocar HS	3½	4600	Own	L	4	4½x5½	350.0	32.4	45@1450	G	Own	Long	Spic	Ross	Str	Gra	DR	Own	4	Own	2R	54.3	O2IM	516	114	7600	40x8	40x8D
***Autocar SHS	3½	4800	Own	L	6	4¼x4¾	404.0	43.4	94@2500	G	Own	Long	Spic	Ross	Str	Gra	DR	Own	4	Own	2R	54.3	O2IM	516	114	7900	40x8	40x8D
Brockway 80 C	* 9500	1215	Con	L	6	3⅞x4	214.7	27.3	71@3200	C	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	4	Tim	Sp	36.2	GB4IM	248	149	4075	20x6.00	20x6.00D
Brockway 90 C	*11500	1525	Con	L	6	3⅞x4⅝	248.2	27.3	70@3200	C	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	4	Tim	Sp	37.4	L4IH	353	149	4355	20x6.50	20x6.50D
Brockway 92 C	*12500	1800	Con	L	6	3⅞x4⅝	248.2	27.3	70@3200	C	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	4	Tim	Sp	37.4	L4IH	353	149	4450	32x6	32x6D
Brockway 120 C	*15000	1990	Con	H	6	4 x4½	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Zen	P	*Aut	Br-L	4	Tim	Sp	38.5	L4IH	353	156	5500	32x6	32x6D
Brockway 140 C	*17500	2495	Con	H	6	4 x4½	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Zen	P	*Aut	Br-L	4	Wis	2R	43.5	L4IHV	386	156	6100	32x6	32x6D
Brockway 141 C	*19500	2935	Con	H	6	4 x4½	311.0	38.4	73@2400	C	G & O	Br-L	Spic	Ross	Zen	P	*Aut	Br-L	4	Wis	2R	46.2	L4IHV	380	170	6500	32x6	32x6D
Brockway 178 C	*19500	3160	Con	H	8	4½x4¾	380.9	40.8	89@2400	C	G & O	Br-L	Spic	Ross	Zen	P	*Aut	Br-L	4	Wis	2R	46.6	L4IHV	380	170	7100	32x6	32x6D
Brockway 175 C	*19500	3660	Con	H	6	4¾x4¾	427.5	45.9	100@2400	C	G & O	Ful	Spic	Ross	Zen	P	*Aut	Ful	5	Wis	2R	46.6	L4IHV	380	170	7200	34x7	34x7D
Brockway 195 C	*22000	3820	Con	H	6	4¼x4¾	380.9	40.8	89@2400	C	G & O	Br-L	Spic	Ross	Zen	P	*Aut	Br-L	4	Wis	2R	52.4	L4IHV	471	170	8100	34x7	34x7D
Brockway 220 C	*25000	4560	Con	H	6	4¾x4¾	427.5	45.9	100@2400	C	G & O	Br-L	Spic	Ross	Zen	P	*Aut	Br-L	4	Wis	2R	50.7	L4IHV	546	170	8675	36x8	36x8D
Brockway 260 C	*28000	5850	Con	H	6	4½x5¼	501.0	48.6	120@2200	C	G & O	Ful	Spic	Ross	Zen	P	*Aut	Ful	4	Wis	2R	53.7	L4IHV	546	212	9000	22x10.50	22x10.50D
Chevrolet	½	345	Own	H	6	3⅛x3¾	194.0	26.3	50@2600	G	Har	Own	Own	Own	Car	P	DR	Own	3	Own	Sp	13.6	O4IM	101	109	*1880	19x4.75	19x4.75
Chevrolet	1½	520	Own	H	6	3⅛x3¾	194.0	26.3	50@2600	G	Har	Own	Own	Own	Car	P	DR	Own	4	Own	Sp	33.4	——	—	131	2700	30x5	32x6
Chevrolet	1½	575	Own	H	6	3⅛x3¾	194.0	26.3	50@2600	G	Har	Own	Own	Own	Car	P	DR	Own	4	Own	Sp	33.4	O4IM	170	157	3015	30x5	30x5D
Diamond T 210 S F	1½	545	Her	L	6	3⅜x4¼	228.0	27.3	60@2800	G	G & O	Borg	Spic	Ross	Zen	P	Aut	WG	4	Cla	Sp	—	L4IH	196	135⅛	3100	20x5.50B	20x6.50B
Diamond T 210 FF	1½	565	Her	L	6	3⅜x4¼	228.0	27.3	60@2800	G	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	4	Cla	Sp	—	L4IH	196	135⅛	3100	20x5.50B	20x6.50B
Diamond T 240 A	1¾	795	Her	L	6	3⅜x4¼	228.0	27.3	60@2800	G	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	4	Cla	Sp	—	L4IH	219	137	3500	20x6.00B	32x6P
Diamond T 310	2	995	Her	L	6	3⅜x4¼	263.0	31.5	68@2800	G	G & O	Borg	Spic	Ross	Zen	P	Aut	W-G	4	Cla	Sp	—	L4IH	350	155	4200	20x6.50B	20x6.50DB
Diamond T 350	2½	1295	Her	L	6	3⅜x4¼	282.0	33.7	76@2800	G	G & O	Borg	Spic	Ross	Zen	P	Aut	Cla	5	Cla	Sp	—	L4IH	350	155	4700	20x7.00B	20x7.00DB
Diamond T 410A	3	1695	Her	L	6	4 x4½	339.0	38.4	100@2800	G	G & O	Borg	Spic	Ross	Zen	P	Aut	Cov	5	Cla	Sp	—	L4IHV-T	350	160¾	5400	20x7.50B	20x7.50DB
Diamond T 510	4	1995	Her	L	6	4 x4½	339.0	38.4	100@2800	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	4	Tim	Sp	—	L4IHV-T	408	168	6000	20x7.00B	20x8.25 DB
Diamond T 410B	3	2135	Her	L	6	4 x4½	339.0	38.4	100@2800	G	G & O	Cov	Spic	Ross	Zen	P	L-N	Cov	4	Cla	Sp	—	L4IHV-T	408	200	6100	20x7.50B	20x7.50DB
Diamond T 504 A	3	2650	Her	L	6	4 x4½	339.0	38.4	100@2800	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	4	Wis	2 R	—	L4IHV-T	408	176½	6400	20x8.25B	20x8.25DB
Diamond T 506 A	3	2950	Her	L	6	4¼x4½	383.0	43.3	91@2500	G	G & O	Cov	Spic	Ross	Zen	P	L-N	Cov	5	Wis	2 R	—	L4IHV-T	408	184	6400	20x8.25B	20x8.25DB
Diamond T 603	3-4	3395	Her	L	6	4⅜x4¾	428.4	45.9	94@2200	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Cov	5	Wis	2 R	—	L4IHV-T	499	169	7500	20x9.00B	20x9.00DB
Diamond T 606 B	3-4	3695	Her	L	6	4½x5¼	501.0	48.6	110@2200	G	G & O	Cov	Spic	Ross	Zen	P	L-N	Cov	5	Wis	2 R	—	L4IHV-T	499	187½	7500	20x9.00B	20x9.00DB
Diamond T 750	4-5	4925	Her	L	6	4⅜x5¼	529.6	51.4	114@2200	G	G & O	Cov	Spic	Ross	Zen	P	Aut	Br-L	7	Own	Wo	—	L6IHV-T	571	189½	8300	36x8P	36x8P
*Diamond T 801	4	4140	Her	L	6	4¾x4¾	428.4	45.9	94@2200	G	G & O	Cov	SpicBlo	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	—	W4IA-T	238	190	11000	34x7P	34x7DP
*Diamond T 1201	6	5600	Her	L	6	4½x5¼	501.0	48.6	110@2200	G	G & O	Cov	SpicBlo	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	—	W4IA-T	238	190	11700	36x8P	36x8DP
*Diamond T 1602	8	6400	Her	L	6	4⅝x5¼	529.0	51.4	114@2200	G	G & O	Br-L	SpicBlo	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	—	W4IA-T	238	194	12500	36x8P	36x8DP
*Diamond T 1603	8	7500	Wak	L	6	5 x5¾	677.4	60.0	125@2000	G	G & O	Br-L	SpicBlo	Ross	Zen	P	Aut	Br-L	7	Tim	Wo	—	W4IA-T	238	194	12500	36x8P	36x8DP
Dodge Bros. UF 30	½	375	Own	L	4	3⅝x4¾	196.0	21.0	48@2800	G	Fed	Borg	Un	Own	Car	P	DR	Own	3	Own	Sp	12.8	O4IH	121	109	1925	19x5.00	19x5.00
Dodge Bros. F 10	½	445	Own	L	6	3¼x4¼	211.5	25.3	66@3200	C	Fed	Borg	Un	Own	Car	P	DR	Own	3	Own	Sp	12.8	O4IH	121	109	1975	19x5.25	19x5.25
Dodge Bros. G. 20	¾-1	597	Own	L	6	3¼x4¼	211.5	25.3	66@3200	C	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	36.1	O4IH	175.8	131	2520	17x7.50	17x7.50
Dodge Bros. G 21	¾-1	622	Own	L	6	3¼x4¼	211.5	25.3	66@3200	C	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	36.1	O4IH	175.8	157	2670	17x7.50	17x7.50
Dodge Bros. UG 20	¾-1	537	Own	L	4	3⅝x4¾	196.0	21.0	48@2800	G	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	36.1	O4IH	175.8	131	2450	17x7.50	17x7.50
Dodge Bros. UG 21	¾-1	562	Own	L	4	3⅝x4¾	196.0	21.0	48@2800	G	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	36.1	O4IH	175.8	157	2600	17x7.50	17x7.50
Dodge Bros.	1	595	Own	L	6	3⅜x3⅞	208.0	27.3	63@3200	C	Fed	Borg	Un	Han	Zen	P	DR	Own	4	Own	Sp	33.4	O4IH	206	133	2690	20x6.00	32x6
Dodge Bros. UG 30	1½	525	Own	L	4	3⅝x4¾	196.0	21.0	48@2800	G	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	36.1	O4IH	176	131	2490	20x6.00	32x6
Dodge Bros. UG 31	1½	550	Own	L	4	3⅝x4¾	196.0	21.0	48@2800	G	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	36.1	O4IH	176	157	2640	20x6.00	36x6
Dodge Bros. G 30	1½	585	Own	L	6	3¼x4¼	211.5	25.3	60@3100	C	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	37.1	O4IH	187	136	2560	20x6.00	32x6
Dodge Bros. UF 30	1½	595	Own	L	4	3⅝x4¾	196.0	21.0	48@2800	G	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	36.1	O4IH	176	157	2581	20x6.00	32x6
Dodge Bros. G 31	1½	610	Own	L	6	3¼x4¼	211.5	25.3	60@3100	C	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	36.1	O4IH	176	157	2710	20x6.00	32x6
Dodge Bros. UF 31	1½	670	Own	L	4	3⅝x4¾	196.0	21.0	48@2800	G	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	37.1	O4IH	187	136	2631	20x6.00	32x6
Dodge Bros. F 30	1½	695	Own	L	6	3¼x4¼	211.5	25.3	66@3200	C	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	37.1	O4IH	229	165	2807	20x6.00	32x6
Dodge Bros. F 31	1½	770	Own	L	6	3¼x4¼	211.5	25.3	66@3500	C	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	37.1	O4IH	229	165	2757	20x6.00	32x6
†Dodge Bros. UGS 50	1½-3	875	Own	L	4	3⅝x4⅝	196.0	21.0	48@2800	G	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	36.1	O6IHV	273.2	153	3575	20x6.00	32x6S
†Dodge Bros. GS 50	1½-3	935	Own	L	6	3¼x4¼	211.5	25.3	60@3100	C	Fed	Borg	Cle	Own	Car	P	DR	Own	4	Own	Sp	36.1	O6IHV	273.2	153	3650	20x6.00	32x6S
Dodge Bros. F 35	1½	1425	Own	L	6	3⅜x3⅞	208.0	27.3	63@3200	C	Fed	Borg	Cle	Han	Zen	P	DR	Own	4	Own	Sp	41.4	O4IH	305	140	3780	20x6.00	20x6.00D
Dodge Bros. F 36	1½	1485	Own	L	6	3⅜x3⅞	208.0	27.3	63@3200	C	Fed	Borg	Cle	Han	Zen	P	DR	Own	4	Own	Sp	41.4	O4IH	305	165	3972	20x6.00	20x6.00D
Dodge Bros. G 43	2	795	Own	L	6	3¼x4⅜	217.7	25.3	73@3200	C	Fed	Borg	Cle	Own	Car	P	DR	Own	5	Own	Sp	50.0	O4IH	229	136	3345	20x7.00	20x7.00D
Dodge Bros. G 44	2	825	Own	L	6	3¼x4⅜	217.7	25.3	73@3200	C	Fed	Borg	Cle	Own	Car	P	DR	Own	5	Own	Sp	50.0	O4IH	229	165	3470	20x7.00	20x7.00D
*Dodge Bros. F 40	2	1995	Own	L	6	3⅝x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	Sp	43.7	O4IH	350	150	5173	20x6.50	20x6.50D
*Dodge Bros. F 41	2	2085	Own	L	6	3⅝x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	Sp	43.7	O4IH	350	165	5211	20x6.50	20x6.50D
Dodge Bros. F 42	2	2180	Own	L	6	3⅝x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	Sp	43.7	O4IH	350	190	5311	20x6.50	20x6.50D
†Dodge Bros. GS 55	2-4	1260	Own	L	6	3¼x4⅜	217.7	25.3	73@3200	C	Fed	Borg	Cle	Own	Car	P	DR	Own	5	Own	Sp	50.0	O6IHV	365	158	4450	20x7.00	20x7.00D
Dodge Bros.	3	1565	Own	L	6	3⅜x3⅞	241.0	27.3	78@3000	C	Fed	Borg	Un	Han	Zen	Vac	NE	Own	4	Own	Sp	46.3	O4IH	382	165	4520	32x6	32x6D
Dodge Bros.	3	1615	Own	L	6	3⅜x4½	241.0	27.3	78@3000	C	Fed	Borg	Un	Han	Zen	Vac	NE	Own	4	Own	Sp	46.3	O4IH	382	185	4715	32x6	32x6D
Dodge Bros. F 60	3	2645	Own	L	6	3⅝x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	2 R	56.0	O4IH	416	146	5543	32x6	32x6D
*Dodge Bros. F 61	3	2575	Own	L	6	3⅝x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	Sp	48.8	O4IH	416	170	5789	32x6	32x6D
*Dodge Bros. F 62	3	2695	Own	L	6	3⅝x5	309.6	31.5	96@3000	G	Long	Borg	Cle	Sag	DL	P	DR	Own	4	Own	Sp	48.8	O4IH	416	195	5901	32x6	32x6D
Dodge Bros. G 80	4	5250	Own	L	8	3½x5	384.8	39.2	115@3000	G	Long	Borg	Cle	Sag	Str	P	DR	Own	5	Own	Sp	62.7	B4IA-T	650	146	7640	20x9.75	20x9.75D
Dodge Bros. G 81	4	5285	Own	L	8	3½x5	384.8	39.2	115@3000	G	Long	Borg	Cle	Sag	Str	P	DR	Own	5	Own	Sp	69.6	B4IA-T	650	170	7840	20x9.75	20x9.75D
Dodge Bros. G 82	4	5350	Own	L	8	3½x5	384.8	39.2	115@3000	G	Long	Borg	Cle	Sag	Str	P	DR	Own	5	Own	Sp	69.6	B4IA-T	650	195	8040	20x9.75	20x9.75D
Dodge Bros. G 83	4	5415	Own	L	8	3½x5	384.8	39.2	115@3000	G	Long	Borg	Cle	Sag	Str	P	DR	Own	5	Own	Sp	69.6	B4IA-T	650	220	8400	20x9.75	20x9.75D
Essex Com.	¾	435	Own	L	6	2¾x4½	163.0	18.2	55@3300	C	Har	Own	Spic	Gem	Mar	Vac	Aut	Own	3	Own	Sp	5.40	4M	147	110½	1970	20x5	20x5.50
Federal D 3	*1½	670	Con	L	4	3⅞x4½	200.5	24.0	50@2700	C	Long	Borg	Cle	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L4IH	191	130	3225	20x6.00	32x6
Federal E 3	*1½	695	Con	L	6	3⅜x4	215.0	27.3	72@3400	C	Long	Borg	Cle	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L4IH	191	130	3225	20x6.00	32x6
Federal F 7	*1¾	1325	Con	L	6	3⅜x4⅝	248.0	27.3	64@2600	C	Long	Borg	Pet	Gem	Zen	P	DR	Own	4	Tim	Sp	29.2	L4IH	247	132	3765	30x5	30x5D
Federal F 8	*2	1425	Con	L	6	3⅜x4⅝	248.0	27.3	64@2600	C	Long	Borg	Pet	Gem	Zen	P	DR	Own	4	Tim	Sp	34.0	L4IH	269	132	3800	20x6.50B	20x6.50DB
Federal G 5	2	995	Con	L	6	3⅜x4	215.0	27.0	72@3400	C	Long	Borg	Cle	Gem	Zen	P	DR	Own	4	Tim	Sp	34.0	L4IH	269	132	3800	20x6.50B	20x6.50DB
Federal A 6	*2	1695	Con	L	6	3⅜x4⅝	248.0	27.3	64@2600	C	Long	Borg	Pet	Ross	Zen	P	DR	Own	4	Cla	Sp	38.5	L4IH	270	151	4580	32x6	32x6D
Federal A 6 T	*2½	1995	Con	L	6	3⅜x4⅝	248.0	27.3	64@2600	C	Long	Borg	Pet	Ross	Zen	P	DR	Own	4	Tim	Sp	47.1	L4IHV	379	151	5110	32x6	32x6D
Federal A 6 T W	*2½	2130	Con	L	6	3⅜x4⅝	248.0	27.3	64@2600	C	Long	Borg	Pet	Ross	Zen	P	DR	Own	4	Tim	Sp	52.9	L4IHV	379	151	5110	32x6	32x6D
Federal T 3 W	*2½	1595	Wau	L	4	4 x5	251.0	25.6	50@2000	G	Long	Borg	Pet	Ross	Zen	P	DR	Own	4	Tim	Wo	36.3	L4IH	337	148	5110	32x6	36x8
Federal T 3 W F A	*2½-3	1795	Wak	L	4	4 x5	251.0	25.6	50@2000	G	Long	Borg	Cle	Gem	Zen	Vac	DR	Own	4	Tim	Wo	43.9	L4IHV	379	148	5400	32x6	32x6D
*Federal D 2 S W	*3	1050	Con	L	4	3⅞x4¼	200.5	24.0	50@2700	C	Long	Borg	Cle	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L6IH	312	140	3925	20x6.00	32x6
*Federal E 2 S W	*3	1150	Con	L	6	3⅜x4	215.0	27.3	60@2600	C	Long	Borg	Cle	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L6IH	312	145	3975	20x6.00	32x6
*Feleral D 2 D	*3	1350	Con	L	4	3⅞x4¼	200.5	24.0	50@2700	C	Long	Borg	Cle	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L6IH	312	140	4235	20x6.00	32x6
*Feleral E 2 D	*3	1450	Con	L	6	3⅜x4	215.0	27.3	60@2600	C	Long	Borg	Cle	Gem	Zen	P	DR	W-G	4	Cla	Sp	40.8	L6IH	312	145	4310	20x6.00	32x6
Federal T 10 B	*3½-4	2550	Con	H	6	4 x4½	311.0	38.4	75@2200	C	Long	Borg	Pet	Ross	Zen	P	DR	Own	4	Tim	Sp	44.5	L4IHV	379	165	6550	34x7	34x7D
Federal T 10 W	*3½-4	2685	Con	H	6	4 x4½	311.0	38.4	75@2200	C	Long	Borg	Pet	Ross	Zen	P	DR	Own	4	Tim	Wo	44.0	L4IHV	379	165	6550	34x7	34x7D
Federal T 10 D R	*3½-4	2685	Con	H	6	4 x4½	311.0	38.4	75@2200	C	Long	Borg	Pet	Ross	Zen	P	DR	Own	4	Tim	2R	45.6	L4IHV	379	165	6550	34x7	34x7D
Federal A 600	*2½-3	1745	Con	L	6	3⅛x4½	288.3	32.6	73@2600	C	Long	Borg	Cle	Ross	Zen	P	DR	Own	4	Cla	Sp	41.5	L4IH	270	157	5050	20x7.50	20x7.50D
Federal A 600 T	*3-3½	2045	Con	L	6	3⅛x4½	288.3	32.6	73@2600	C	Long	Borg	Cle	Ross	Zen	P	DR	Own	4	Tim	Sp	50.7	L4IHV	379	157	6100	20x8.25	20x8.25D
Federal A 600 T W	*3-3½	2180	Con	L	6	3⅛x4½	288.3	32.6	73@2600	C	Long	Borg	Cle	Ross	Zen	P	DR	Own	4	Tim	Wo	48.8	L4IHV	379	157	6100	20x8.25	20x8.25D
Federal A 600 T D R	*3-3½	2180	Con	L	6	3⅛x4½	288.3

Major Specifications and Mechanical Details of 1932 Commercial Cars

LEADING MAKES NATIONALLY DISTRIBUTED

(Continued from Page 9)

Make and Model	Capacity—Tons or Lbs.	Chassis Price	Engine	Valve Arr'g'm't	No. of Cyls.	Bore and Stroke	Piston Disp.	Tax H P.	Max. Brake H. P. and Peak R. P. M.	Type Camshaft Drive	Radiator Make	Clutch Make	Universals Make	Steering Gear Make	Carburetor Make	Fuel Feed Type	Make Electr'l System	Make Transmission	No. Spds. For.	Rear Axle Make	Rear Axle Type	Final Drive	Final Gear Reduction	Type Service Brakes	Area Service Brake Lining	Standard Wheel Base	Chassis Wgt.	Tire Sizes Standard Front	Tire Sizes Standard Rear
Gramm A X 4	1	795	Con	L	4	3⅛x4½	200.4	24.0	50@2800	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4IH	380	131	*3300	20x6.00	20x6.50
Gramm A X 6	1	895	Con	L	6	3⅛x4	214.7	27.3	61@3000	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4TH	380	131	3550	20x6.00	20x6.50
Gramm B X 4	1½	895	Con	L	4	3⅛x4¼	200.4	24.0	50@2800	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4IH	380	131	3475	20x6.00	20x6.00D
Gramm B X 6	1½	995	Con	L	6	3⅛x4	214.7	27.3	61@3000	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	36.3	L4IH	380	131	3725	20x6.00	20x6.00D
Gramm B	2	1295	Lyc	L	6	3¼x4½	224.0	25.3	61@2900	C	Per	Own	Blo	Ross	Zen	Vac	Aut	Cov	4	Tim	Sp	34.3	L4IH	278	140	4150	20x6.50	20x6.50D
†Gramm C X 4	2	1095	Con	L	4	4⅛x4¼	227.0	27.2	55@2600	C	Per	Jon	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	37.0	L4IH	452	131	3900	20x6.50	20x6.50D
Gramm C X 6	2	1295	Con	L	6	3⅜x4⅝	248.2	27.3	70@3000	C	Per	Own	Blo	Ross	Til	P	Aut	W-G	4	Tim	Sp	37.0	L4IH	452	131	4150	20x6.50	20x6.50D
Gramm C	2	1795	Lyc	L	6	3⅜x4½	278.6	31.5	82@2600	C	Per	Own	Blo	Ross	Zen	P	Aut	Cov	4	Tim	Sp	31.9	L4IH	353	131	4800	20x7.00	20x7.00D
Gramm C F	2½	1895	Lyc	L	6	3¾x4½	299.0	33.7	85@2600	C	Per	Br-L	Blo	Ross	Til	P	Aut	Br-L	4	Tim	Sp	38.2	L4IH	353	160	4900	20x7.50	20x7.50D
Gramm D	2½	1995	Lyc	L	6	3¾x4½	299.0	33.7	90@2200	G	Per	Br-L	Blo	Ross	Zen	P	Aut	Br-L	4	Tim	Sp	33.0	L4IHV	339	160	5300	20x7.50	20x7.50D
Gramm CXH	2-3	1345	Her	L	6	3¾x4¼	282.0	33.7	73@3000	C	Per	Br-L	Blo	Ross	Zen	P	Aut	Br-L	4	Tim	Sp	37.0	L4IH	353	131	4300	20x6.50	20x6.50D
Gramm E	3	3595	Lyc	L	6	3⅞x5	353.8	39.0	90@2200	G	Per	Br-L	Blo	Ross	Zen	P	Aut	Br-L	4	Tim	Sp	35.0	L4IHV	374	160	5950	20x8.25	20x8.25D
Gramm E Y	3	3595	Con	H	6	4½x4¾	380.8	40.8	90@2200	C	Per	Ful	Blo	Ross	Zen	P	Aut	Br-L	4	Tim	Sp	39.0	L4IHA	—	190	7295	20x7.50	20x7.50D
Gramm EX	3-4	2295	Con	L	6	3⅞x4½	318.0	38.0	80@2700	—	Per	Br-L	Blo	Ross	Zen	P	Aut	Br-L	4	Tim	Sp	35.0	L4IHV	339	160	5200	20x8.25	20x8.25D
Gramm ED	3-4½	3995	Cum-D	H	4	4¾x6	448.0	38.0	85@1800	G	Per	Br-L	Blo	Ross	Zen	P	L-N	Br-L	4	Tim	Sp	39.0	L4IHV	374	160	5600	20x8.25	20x8.25D
Gramm G	4	3695	Con	H	6	4⅜x4¾	428.4	45.9	100@2200	C	Per	Br-L	Blo	Ross	Zen	P	Aut	Br-L	4	Wis	2R	49.5	L4IHV	768	165	8200	20x9.00	20x9.00D
Gramm G S	4	3695	Lyc	L	8	3¾x4¾	419.6	44.4	130@2700	G	Per	Br-L	Blo	Ross	Zen	P	Aut	Br-L	4	Wis	2R	—	L4IHV	768	165	8200	20x9.00	20x9.00D
Gramm G Y	4	4345	Con	H	6	4⅜x4¾	428.4	45.9	100@2200	C	Per	Ful	Blo	Ross	Zen	P	Aut	Cov	4	Wis	2R	28.0	BW4IM	736	210	7700	20x8.25	20x8.25D
Gramm G W	5	5175	Con	H	8	4⅜x4¾	428.0	45.9	100@2200	C	Per	Br-L	Blo	Ross	Zen	P	Aut	Br-L	4	Wis	2R	—	41A	864	157	9500	20x9.00	20x9.00D
Gramm GWD	5	6495	Cum-D	H	6	4¾x6	672.0	57.0	125@1800	G	Per	Br-L	Blo	Ross	——	P	L-N	Bl	4	Wis	2R	25.5	41A	864	157	9600	20x9.00	20x9.00D
Gramm H Y	5	6545	Con	L	6	4¾x5¾	611.4	54.1	127@2300	G	Per	Ful	Blo	Ross	Zen	P	Aut	Ful	4	Wis	2R	25.2	41A	996	236	10100	20x9.00	20x9.00D
Indiana 85	1½	885	Her	L	6	3⅜x4½	263.0	31.5	68@2800	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Sp	35.1	L4IH	249	141	3900	20x6.50	20x6.50D
Indiana 85 DR	1½	1190	Her	L	6	3⅜x4½	263.0	31.5	68@2800	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	5	Wis	2R	40.1	L4IH	316	141	4200	20x6.50	20x6.50D
Indiana 95	2	1095	Her	L	6	3¾x4¼	282.0	33.7	73@2800	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Sp	36.2	L4IH	353	141	4400	32x6	32x6DP
Indiana 95 DR	2½	1275	Her	L	6	3¾x4¼	282.0	33.7	73@2800	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2R	41.3	L4IH	353	141	4650	20x7.50	20x7 50DB
Indiana 17	2½	2450	Her	L	6	4⅜x4¾	428.4	45.9	94@2200	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Sp	35.1	L4IHV	358	170	7000	20x8.25	20x8.25D
Indiana 106 DR	2½	1850	Her	L	6	4 x4½	339.0	38.4	76@2400	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2R	40.3	L4IHV	353	156	6000	20x7.50	20x7.50D
*Indiana 95 SBT 151	3	1675	Her	L	6	3¾x4¼	282.0	33.7	73@2800	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Sp	45.8	L6HIV	559	168	6500	32x6	32x6DP
*Indiana 95 SW 75	3	1735	Her	L	6	3¾x4¼	282.0	33.7	73@2800	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Wo	45.8	L6HIV	450	186	6200	32x6	32x6DP
Indiana 17 DR	3	2675	Her	L	6	4⅜x4¾	428.4	45.9	94@2200	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2R	38.6	L4IHV	398	170	7300	20x8.25	20x8.25D
Indiana 106 SW 151	3	2675	Her	L	6	4 x4½	339.0	38.4	76@2400	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Wo	42.6	L6IHV	559	188	7500	32x6.00P	32x6DP
Indiana 19 DR	3½	3400	Her	L	6	4⅜x4¾	428.4	45.9	94@2200	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2R	52.3	L4IHV	489	170	8100	20x9.00	20x9.00D
Indiana 17 SBT 251	4	3250	Her	L	6	4⅜x4¾	428.4	45.9	94@2200	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Sp	37.8	L6HIV	625	188	8300	34x7	34x7D
*Indiana 17 SW 251	4	3475	Her	L	6	4⅜x4¾	428.4	45.9	94@2200	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Tim	Wo	38.1	L6HIV	625	188	8500	34x7	34x7D
Indiana 43 DR	4	4300	Her	L	6	4½x5¼	501.0	48.6	110@2200	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2R	50.7	L4IHV	546	170	8500	20x9.75	20x9.75D
Indiana 45 DR	5	4800	Her	L	6	4⅝x5¼	529.0	51.3	115@2200	G	Yo	Br-L	Spic	Ross	Str	P	Aut	Br-L	4	Wis	2R	45.4	L4IHV	546	170	8700	20x9.75	20x9.75D
International A 1	¾	615	Wak	L	4	3⅝x4½	186.0	21.0	39@2400	G	Mod	Mec	Mec	Ross	Zen	Vac	DR	W-G	4	Own	Sp	39.5	B4IM	212	136	*2887	20x5.50	20x5.50
International M 2	1	850	Wak	L	4	3⅝x4½	186.0	21.0	39@2400	G	Mod	Mec	Mec	Ross	Zen	Vac	DR	W-G	4	Own	Sp	39.5	B4IM	217	118	3180	20x6.50	20x6.50
International A 2	1½	615	Wak	L	4	3⅝x4½	186.0	21.0	39@2400	G	Mod	Mec	Mec	Ross	Zen	Vac	DR	W-G	4	Own	Sp	39.5	B4IM	212	136	2935	20x6.00	20x6.00
International B 2	1½	685	Wak	L	4	3⅝x4½	186.0	21.0	39@2400	G	Mod	Mec	Mec	Ross	Zen	Vac	DR	Mec	6	Own	Sp	47.3	B4IM	212	136	2945	20x6.00	20x6.00
International A L 3	1½	1450	Lyc	L	6	3¼x4½	224.0	25.3	54@2700	G	Mod	Own	Mec	Ross	Zen	Vac	DR	W-G	4	Own	Sp	42.9	B4IM*	295	138	4032	20x6.00	20x6.50D
International A 3	1½	795	Lyc	L	6	3¼x4½	224.0	25.3	54@2700	G	Mod	Rock	Mec	Ross	Zen	P	DR	W-G	4	Own	Sp	33.8	B4IM*	287	136	3572	20x6.00	20x6.00
International A 3½	1½	970	Lyc	L	6	3¼x4½	224.0	25.3	54@2700	G	Mod	Rock	Mec	Ross	Zen	P	DR	W-G	4	Own	Sp	34.9	B4IM*	302	136	3600	20x6.00	20x6.00D
International A 4	2	1750	Own	H	6	3⅝x4½	279.0	31.5	67@2600	G	Mod	Own	Mec	Ross	Zen	P	DR	Own	5	Own	Sp	47.8	B4IH*	378	145	5203	32x6	32x6D
International W 1	2½	3850	Hall	H	4	4¼x5½	312.0	28.9	59@2000	G	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	Sp	62.5	BO4IM*	710	148	8300	36x5S	36x8S
International A 5	3	2350	Own	H	6	3⅝x4½	279.0	31.5	67@2600	G	Mod	Own	Mec	Ross	Zen	P	DR	Own	5	Own	Sp	52.6	B4IM*	430	156	5895	34x7	34x7D
International A 6	3	2675	Own	H	6	3⅝x4½	279.0	31.5	67@2600	G	Mod	Own	Mec	Ross	Zen	P	DR	Own	5	Own	Sp	62.5	B4IM*	430	156	6120	34x7	34x7D
International W 3	3½	4850	Hall	H	4	4¾x5½	390.0	36.1	69@2000	G	Own	Own	Own	Own	Zen	Vac	RB	Own	5	Own	2R	70.5	BO4IM*	794	160	10125	36x8S	40x12S
International A 7	5-7½	6200	Own	H	6	4½x5½	525.0	48.6	98@1800	G	Mod	Rock	Mec	Ross	Zen	P	DR	Own	5	Own	2R	52.3	BO4IM-T	730	160	11590	20x9.75	20x9.75D
International A 8	7½	6300	Own	H	6	5 x5½	650.0	60.0	115@1800	G	Mod	Rock	Mec	Ross	Zen	P	DR	Own	5	Own	2R	52.3	BO4IM-T	730	160	11590	20x9.75	20x9.75D
Mack B G	——	2500	Own	L	6	3¼x5	248.9	25.4	41@2600	G	Own	Own	Spic	Gem	Str	P	NE	Own	4	Tim	Sp	33.5	B4IM-T	399	160	6000	20x8.25B	20x6.00DB
Mack B L	——	3900	Own	L	6	3⅝x5	309.6	31.6	75@2500	G	Own	Own	Spic	Own	Str	P	NK	Own	4	Own	Sp	40.0	B4IM	399	156	4950	20x8.25B	20x8.25DB
Mack B F	——	4260	Own	L	6	3⅝x5	309.6	31.6	75@2500	G	Own	Own	Spic	Han	Str	P	NE	Own	4	Own	2R	34.4	B4IM	399	180	5800	20x8.25B	20x9.00DB
Mack A B-4	——	4000	Own	L	4	4¼x5	283.7	28.9	63@2100	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	Ch	Opt	O4IV	471	146½	6450	34x7P	34x7DP
Mack A B-4	——	4260	Own	L	4	4¼x5	283.7	28.9	63@2100	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	2R	Opt	O4IV	471	164½	6850	34x7P	34x7DP
Mack A B-6	——	4150	Own	L	6	3⅝x5	309.6	31.6	75@2500	G	Own	Own	Spic	Own	Str	P	NE	Own	4	Own	Ch	Opt	O4IV	471	146½	6450	34x7P	34x7DP
Mack A B-6	——	4500	Own	L	6	3⅝x5	309.6	31.6	75@2500	G	Own	Own	Spic	Own	Str	P	NE	Own	4	Own	2R	Opt	O4IV	471	164½	6850	34x7P	34x7DP
Mack B M	——	4700	Own	L	6	4 x5½	414.7	38.4	94@2400	G	Own	Own	Spic	Han	Str	P	NE	Own	4	Own	2R	Opt	O4IV	427	157	7500	20x9.00B	20x9.00DB
Mack B C	——	5500	Own	L	6	4 x5½	414.7	38.4	94@2400	G	Own	Own	Spic	Own	Str	P	NE	Own	4	Own	Ch	Opt	O4IV	590	154	8000	36x8P	36x8DP
Mack B C	——	5250	Own	L	6	4 x5½	414.7	38.4	94@2400	G	Own	Own	Spic	Own	Str	P	NE	Own	4	Own	2R	Opt	O4IV	610	154	7850	36x8P	36x8DP
Mack B X	——	5750	Own	L	6	4¼x5½	468.1	43.3	104@2300	G	Own	Own	Spic	Rnss	Str	P	NE	Own	4	Own	Ch	Opt	O4IV	619	160	7900	22x9.75B	22x9.75DB
Mack B X	——	5600	Own	L	6	4¼x5½	468.1	43.3	104@2300	G	Own	Own	Spic	Rnss	Str	P	NE	Own	4	Own	2R	Opt	O4IV	619	160	8050	22x9.75B	22x9.75DB
Mack B J	——	6450	Own	L	6	4½x5½	525.5	48.6	125@2300	G	Own	Own	Cle	Han	Str	P	NE	Own	4	Own	2R	Opt	O4IV	618	197	9800	22x10.50B	22x10.50DB
Mack B Q	——	6800	Own	L	6	4¾x5¾	610.6	54.1	128@2200	G	Own	Own	Cle	Rnss	Str	P	NE	Own	4	Own	2R	Opt	O4IV	618	191	10000	22x10.50B	22x10.50DB
Mack A K-4	——	5150	Own	L	4	5 x6	471.2	40.0	75@1800	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	Ch	Opt	O4IV	492	174	9500	36x8S	36x5DS
Mack A K-4	——	5250	Own	L	4	5 x6	471.2	40.0	75@1800	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	2R	Opt	O4IV	492	174	9400	36x8S	36x5DS
Mack A K-6	——	6450	Own	L	6	4¾x5¾	610.6	54.1	128@2200	G	Own	Own	Spic	Han	Str	P	NE	Own	4	Own	2R	Opt	O4IV	561	186	10400	22x10.50B	20x10.50DB
Mack A C-4-L	——	4950	Own	L	4	5 x6	471.2	40.0	75@1800	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	Ch	Opt	OJXM	478	156	9100	36x8S	40x5DS
Mack A C-4-M	——	5500	Own	L	4	5 x6	471.2	40.0	75@1800	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	Ch	Opt	OJXM	478	168	9800	36x8S	40x6DS
Mack A C-4-H	——	6000	Own	L	4	5 x6	471.2	40.0	75@1800	G	Own	Own	Spic	Own	Str	Gra	NE	Own	4	Own	Ch	Opt	OJXM	478	168	10150	36x7S	40x7DS
Mack A C-6	——	6450	Own	L	6	4¾x5¾	610.6	54.1	128@2200	G	Own	Own	Spic	Han	Str	P	NE	Own	4	Own	Ch	Opt	O4IV	755	186	11400	24x10.50B	24x10.50DB
Mack A P	——	8500	Own	L	6	5 x6	706.5	60.0	138@1900	G	Own	Own	Spic	Han	Str	Gra	NE	Own	4	Own	Ch	Opt	O2IV	384	191	11700	36x7S	40x8DS
Mack A K-6 6 wheel	——	9000	Own	L	6	4¾x5¾	610.6	54.1	128@2200	G	Own	Own	Cle	Han	Str	P	NE	Own	4	Own	2R	Opt	O6IV	1044	152-52	15600	22x9.75B	22x9.75DB
Mack A C-6 6 wheel	——	8500	Own	L	6	4¾x5¾	610.6	54.1	128@2200	G	Own	Own	Spic	Han	Str	P	NE	Own	4	Own	Ch	Opt	O6IV	1052	145-52	14300	40x8P	40x8DP
Mack A P 6 wheel	——	10500	Own	L	6	5 x6	706.5	60.0	138@1900	G	Own	Own	Spic	Han	Str	Gra	NE	Own	4	Own	Ch	Opt	O6IV	1052	145-52	14600	40x8P	40x8DP
Mack A P 6 wheel	——	11000	Own	L	6	5 x6	706.5	60.0	138@1900	G	Own	Own	Cle	Han	Str	Gra	NE	Own	4	Own	2R	Opt	O6IV	1044	152-52	15950	22x9.75B	22x9.75DB
Pierce-Arrow 13S 385	2-2½	2500	Own	L	8	3½x5	385.0	39.2	125@2800	C	Long	Long	Cle	Han	Str	P	DR	Cla	4	Tim	Sp	33.5	B4IM-T	399	160	6000	20x8.25B	20x8.25DB
Pierce-Arow 15T 298	3-3½	1950	Her	L	6	3¾x4½	298.0	33.7	70@2600	G	Long	Long	Cle	Han	Zen	P	DR	Cla	4	Tim	Sp	40.0	B4IM	399	150	5725	20x8.25B	20x8.25DB
Pierce-Arrow 17T 361	3-4	2350	Her	L	6	4¼x4½	361.0	40.3	77@2400	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	Sp	34.4	B4IM	399	180	5800	20x8.25B	20x9.00DB
Pierce-Arrow 18W 361	3½-4½	3000	Her	L	6	4¼x4½	361.0	40.3	77@2400	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	Wo	41.9	B4IA-T	473	150	6660	20x9.00B	20x9.00DB
Pierce-Arrow 19R 428	3½-4½	3600	Her	L	6	4⅜x4¾	428.0	46.0	94@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	Wo	39.6	B4IA	473	150	6800	20x9.00B	20x9.00DB
Pierce-Arrow 22R 501	4½-5½	3750	Her	L	6	4½x5¼	501.0	48.6	110@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	Wo	38.0	B4IA	473	150	7050	20x9.75B	20x9.75DB
Pierce-Arrow 21X 501	5-6	4200	Her	L	6	4½x5¼	501.0	48.6	110@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	Wo	40.2	T4IA	618	160	9250	20x10.50B	20x10.50DB
Pierce-Arrow 24M 611	5-6	5000	Her	L	6	4¾x5¾	611.0	54.1	130@2000	G	Long	Long	Spic	Rosa	Str	P	DR	Own	4	Tim	Wo	39.9	T4IA-T	618	160	10200	20x10.50B	20x10.50DB
Pierce-Arrow 28X 501	6-7	4600	Her	L	6	4½x5¼	501.0	48.6	110@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Own	Wo	53.0	TO4IA	720	160	10675	24x10.50B	24x10.50DB
Pierce-Arrow 28M 611	6-7	5400	Her	L	8	4¾x5¾	611.0	54.1	130@2000	G	Long	Long	Spic	Ross	Str	P	DR	Own	4	Own	Wo	52.5	TO4IA	720	160	11600	24x10.50B	24x10.50DB
Pierce-Arrow 28Y 479	6-7	4400	Her	L	6	4⅝x4¾	479.0	51.3	104@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Own	Wo	53.0	TO4IA	720	160	10675	24x10.50B	24x10.50DB
Pierce-Arrow 31K 611	7½-10	5300	Her	L	8	4¼x4½	361.0	40.3	77@2400	G	Long	Long	Spic	Ross	Str	P	DR	Own	4	Own	Wo	42.0	TO4IA	720	170	11675	24x10.50B	40x8DS
Pierce-Arrow 75M 779T	*75000	6400	Her	L	6	5¼x6	779.0	66.1	150@1800	G	Long	Long	Spic	Ross	Str	P	DR	Own	4	Own	Wo	51.9	TO4IA	720	190	12750	24x10.50B	24x10.50DB
Pierce-Arrow 27T 361T	*27000	2450	Her	L	6	4¼x5½	611.0	54.1	130@2000	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	Sp	48.1	B4IM	399	150	5725	20x8.25	20x8.25D
Pierce-Arrow 33R 501T	*35000	3800	Her	L	6	4½x5¼	501.0	48.6	110@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	Wo	47.8	B4IA	473	150	7050	20x9.75	20x9.75D
Pierce-Arrow 45X 501T	*45000	4800	Her	L	6	4½x5¼	501.0	48.6	110@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	Wo	57.2	T4IA	618	160	9300	20x10.50	20x10.50D
†Pierce-Arrow 34L 501S4	*34000	6400	Her	L	6	4½x5¼	501.0	48.6	110@2200	G	Long	Long	Cle	Han	Zen	P	DR	Cov	4	Tim	Wo	49.0	T6IA	1022	200	13200	20x9.75	20x9.75D
†Pierce-Arrow 41K 779S4	*44000	7500	Her	L	6	5¼x6	779.0	66.1	150@1800	G	Long	Long	Spic	Ross	Str	P	DR	Own	4	Tim	Wo	47.2	T6IA	1022	200	14500	20x10.50	20x10.50D
†Pierce-Arrow 34K 611S4	*34000	7200	Her	L	6	4¾x5¾	611.0	54.1	130@2000	G	Long	Long	Spic	Ross	Str	P	DR	Own	4	Tim	Wo	40.6	T6IA	1022	200	14200	20x9.75	20x9.75D
Reo 1 A	1½	625	Own	L	4	3⅛x4½	205.0	23.3	51@2500	G	Per	Long	Cle	Ross	Zen	P	DR	Own	4	Cla	Sp	37.1	4IH	246	130	2930	20x6.00	32x6
Reo 1 C	1½	665	Own	L	4	3⅛x4½	205.0	23.3	51@2500	G	Per	Long	Cle	Ross	Zen	P	DR	Own	4	Cla	Sp	37.1	4IH	246	160	3020	20x6.00	32x6
Reo 1 B	1½	795	Own	L	6	3¼x5	230.0	23.4	68@2800	C	Own	Own	Cle	Ross	Zen	P	DR	Own	4	Own	Sp	34.8	4IH	246	140	3100	20x6.00B	32x6
Reo 1 D	1½	835	Own	L	6	3¼x5	230.0	23.4	68@2800	C	Own	Own	Cle	Ross	Zen	P	DR	Own	4	Own	Sp	37.1	4IH	246	164	3200	20x6.00	32x6
Reo 2B	2	1095	Own	L	6	3⅜x5	268.0	27.3	75@2800	C	Own	Long	Cle	Ross	Zen	P	DR	Own	4	Own	Sp	6.6	4IH	289	142	3865	20x6.50	20x6.50D
Reo 2 D	2	1135	Own	L	6	3⅜x5	268.0	27.3	75@2800	C	Own	Long	Cle	Ross	Zen	P	DR	Own	4	Own	Sp	5.66	4IH	289	166	4015	20x6.50	20x6.50D
Reo 2 H	†2	1625	Own	L	6	3⅜x5	268.0	27.3	75@2800	C	McC	Br-L	Cle	Ross	Zen	P	DR	Own	4	Own	Sp	6.5	4IH	289	142	4475	20x7.00	20x7.00D
Reo 2 J	†2	1695	Own	L	6	3⅜x5	268.0	27.3	75@2800	C	McC	Br-L	Cle	Ross	Zen	P	DR	Own	4	Own	Sp	6.5	4IH	289	166	4650	20x7.00	20x7.00D
Reo 3 H	3	2035	Own	L	6	3⅝x5	309.6	31.5	85@2800	C	McC	Br-L	Cle	Ross	Zen	P	DR	Own	4	Own	Sp	6.5	4IH	344	153	5125	20x7.50	20x7.50D
Reo 3 J	3	2085	Own	L	6	3⅝x5	309.6	31.5	85@2800	C	McC	Br-L	Cle	Ross	Zen	P	DR	Own	4	Own	Sp	6.5	4IH	344	170	5285	20x7.50	20x7.50D
Reo 3 K	3	2155	Own	L	6	3⅝x5	309.6	31.5	85@2800	C	McC	Br-L	Cle	Ross	Zen	P	DR	Own	4	Own	Sp	6.5	4IH	344	185	5400	20x7.50	20x7.50D
Reo 4 H	4	3070	Own	L	8	3⅜x5	358.0	36.4	110@2800	C	Own	Long	Cle	Ross	Sch	P	DR	Own	4	Own	Sp	7.16	4IH	390	150	6210	20x9.00	20x9.00D
Reo 4 J	4	3125	Own	L	8	3⅜x5	358.0	36.4	110@2800	C	Own	Long	Cle	Ross	Sch	P	DR	Own	4	Own	Sp	6.14	4IH	390	170	6340	20x9.00	20x9.00D
Reo 4 K	4	3260	Own	L	8	3⅜x5	358.0	36.4	110@2800	C	Own	Long	Cle	Ross	Sch	P	DR	Own	4	Own	Sp	6.14	4IH	390	190	6455	20x9.00	20x9.00D
Stewart 41 X	¾	695	Lyc	L	6	3⅛x4½	207.0	23.44	56@2600	G	Fed	Borg	Spic	Ross	Zen	P	DR	W-G	4	Cla	Sp	5.40	B4	180	124	2873	18x6.50	18x6.50
Stewart 42 X	1½	795	Lyc	L	6	3¼x4½	224.0	25.3	62@2600	G	Fed	Borg	Spic	Ross	Zen	P	DR	W-G	4	Cla	Sp	35.1	B4IM	257	134	3730	20x6.50	20x6.50
Stewart 43 X	2	995	Lyc	L	6	3¼x4½	242.0	27.3	62@2800	G	Fed	Borg	Sp

TRUCK FLEET OPERATOR USES OWN RECORD SYSTEM

(Continued from Page 4)

next day. After filling out this sheet for each truck, the fleet record sheet is made out, using the sum of the items on the individual sheets. This fleet sheet is a duplicate of the individual form. The time items on the fleet sheet are totaled and must check with the total time in service.

"The volume record is filled out from the driver's daily card. The headings cover the entire truck service and those that have been worked on are filled out each day. At the end of each week a total is taken and the work as shown on the fleet daily record sheet must check with the totals as shown on the volume record. The monthly totals must also check in the same way.

"All the copies of the record forms are actual reproductions of our records. Certain changes have been made for the purposes of printing, as work where we use colors must be shown by cross-hatching. Trips shown on the driver's card appear in the volume record and the day's work for the truck is shown on the daily record sheet.

"The individual drivers are compared by computing the number of units handled per hour on both pick up and delivery work. This material is taken from the month's totals as shown on the daily record sheets. The hour is used as a unit to prevent any confusion with the unit costs.

"The best guide to a study of our truck operations is the sheet showing the division of truck time for the month. This graph is made up from percentages as shown on the daily record sheet.

"As all our breakdown sheets are loose leaf, it is possible to compare any two periods by placing the sheets on the desk. The reason for a change in unit costs can usually be located in this way. Our records also contain charts showing the unit costs for each service that are plotted up each month. As a matter of suggestion, a slide rule will cut the work of figuring percentages and unit costs in half.

"The first step in the breakdown to the unit cost is the determination of the correcting factor. This is the factor used to increase the actual time of the different services so that when the final unit costs are determined, they will cover the unproductive truck time. The delivery and the pick up work is the only work that can be considered as being productive, and these two services must cary the entire truck overhead. This correcting factor is determined by dividing the total truck time for the month by the sum of the two productive services."

ILLINOIS DEALERS TAKE FIRM POSITION ON CURRENT PROBLEMS

(Continued from Page 1)

of the association, was in charge of the program.

Resolutions passed urged reduced taxes, rigid economy and the elimination of costly and unneeded services on the part of legislative, executive and judicial governmental divisions. Opposition was expressed to gasoline tax increases or diversion of fuel funds to uses not connected with road building and maintenance. Increases in motor vehicle registration fees, imposition of added forms of licenses on motor vehicles or on the automobile industry were branded as discriminatory, confiscatory and unjust. It was advocated that the present Federal excise taxes on motor vehicles, parts and supplies should be eliminated.

The association took a stand against such legislative proposals as compulsory liability insurance on private cars, recording, filing and taxing of conditional sales contracts; drivers' license laws so far suggested in Illinois, financial responsibility for private car owners such as is at present required in some states, and increased restrictions on motor vehicle operation not clearly in the interests of traffic safety.

Resolutions were passed favoring compulsory inspection of the physical condition of motor vehicles at least once, and preferably twice, a year at inspection stations meeting definite equipment, efficiency and reliability standards. Another declared for a properly drawn certificate of title law, along with relief from burdensome conditions and heavy licenses upon dealers.

CONN. TRUCKERS NOMINATE SLATE

(Continued from Page 1)

solidated Motor Lines, Hartford; Louis Barletta, Standard Truckers' Company, New Haven; Morris J. Bisnovich, Crowe & Co., Inc., Waterbury; Edward B. McGurk, the Edward Balf Company, Hartford; William E. Connors, Byrolly Transportation Company, Waterbury; Michael J. Darcey, Darcey Transportation Company, Waterbury.

Bryant C. Edgerton, Edgerton & Sons, Bridgeport; Leon St. John, Sommers Transfer Company, Springfield, Mass.; Louis A. Johns, Adley Express Company, New Haven; Joseph Kramer, National Transportation Company, Bridgeport; Peter N. Laskas, Laskas Motor Lines, Waterbury, and William A. Perrett, Perrett & Glenney, South Manchester.

PURE OIL BRANCH

Indianapolis, Ind., Dec. 29. — The Pure Oil Company announces the establishment of a zone office in Indianapolis with the appointment of L. W. Dunham, formerly credit manager of the central marketing division for that company at Columbus, O., as supervisor.

HOFFMAN AND LEWIS TO ADDRESS FOREIGN VISITORS AT N .Y. SHOW

(Continued from Page 1)

Graham, chairman of the Chamber's Export Committee which is sponsoring the program.

Other speakers previously announced are Ellis Hampton, president of the Automobile Dealers' Association of Argentina, who will review automobile developments and trends in his country, and F. A. Kettaneh, president of the Automobile Dealers' Association of Syria, whose topic will be "Rail and Truck Coordination As a World Task."

Mr. Graham also announced that there will be a meeting of the export managers of automobile companies at the chamber headquarters on Tuesday, January 10. The general theme of this session, he said, will be "Export Preparedness."

Subjects scheduled for discussion and consideration at the meeting include: Reviews of motor trade conditions in the various export markets and plans for solving those situations which now work to the disadvantage of the motor industry in its sales efforts abroad.

NAT MALLOUF JOINS DIAMOND T MOTOR

Long Island City, N. Y., Dec. 29. —The Diamond T Motor Car Company announce the association of Nat Mallouf with its national account department.

Major Specifications and Mechanical Details of 1932 Commercial Cars

LEADING MAKES NATIONALLY DISTRIBUTED

(Continued from Page 10)

Make and Model	Capacity—Tons or Lbs.	Chassis Price	Engine	Valve Arr'g'm't	No. of Cyls.	Bore and Stroke	Piston Disp.	Tax H. P.	Max. Brake H. P. and Peak R. P. M.	Type Camshaft Drive	Radiator Make	Clutch Make	Universals Make	Steering Gear Make	Carburetor Make	Fuel Feed Type	Make Electr'l System	Make Transmission	No. Spds. For.	Rear Axle Make	Rear Axle Type	Rear Axle Final Drive	Rear Axle Final Gear Reduction	Type Service Brakes	Area Service Brake Lining	Standard Wheel Base	Chassis Wgt.	Standard Tire Sizes Front	Standard Tire Sizes Rear
White 621	*18000	4650	Own	H	6	4 x5¼	396.0	38.4	92@2100	C	Own	Own	Spic	Ross	Zen	P	DR	Own	4	Own	Sp	41.4	OL4IHV	484	157	7945	20x9.00B	20x9.00DB
White 640	*20000	6100	Own	H	6	4⅝x5¾	519.0	45.9	118@2100	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	Sp	33.9	O4IA	553	180	9200	20x9.00B	20x9.00DB
White 630	*20000	5000	Own	H	6	4 x5¼	396.0	38.4	92@2100	C	Own	Own	Spic	Ross	Zen	P	DR	Own	4	Own	Sp	41.4	O4IHV	553	168	8500	20x9.00B	20x9.00DB
White 58	*22000	4400	Own	L	4	4¼x5¾	326.0	28.9	54@1600	G	Own	Own	Spic	Own	Zen	Vac	Eis	Own	4	Own	2R	49.7	OPXM	224	180	7787	36x5	36x8D
White 630 A	*22000	5000	Own	H	6	4 x5¼	396.0	38.4	92@2100	C	Own	Own	Spic	Ross	Zen	P	DR	Own	4	Own	Sp	41.4	O4IHV	553	168	6500	20x9.00B	20x9.00DB
White 641	*24000	6450	Own	H	6	4⅝x5¾	519.0	45.9	118@2100	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	2R	46.9	O4IA	633	180	9700	20x9.75B	20x9.75DB
*White 630 SW200	*24000	6245	Own	H	6	4 x5¼	396.0	38.4	92@2100	C	Own	Own	Spic	Ross	Zen	P	DR	Own	4	Tim	Wo	44.2	OTIHV	677	193	10000	20x8.25B	20x8.25DB
White 631	*24000	5750	Own	H	6	4 x5¼	396.0	38.4	92@2100	C	Own	Own	Spic	Ross	Zen	P	DR	Own	4	Own	2R	54.9	O4IHV	633	168	9000	20x9.25B	20x9.25DB
White 642	*28000	6750	Own	H	6	4⅝x5¾	519.0	45.9	118@2100	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	2R	66.5	O4IA	633	180	10600	24x9.75B	24x9.75DB
White 58 SS	*30000	5300	Own	L	4	4¼x5¾	326.0	28.9	54@1600	G	Own	Own	Spic	Ross	Zen	Vac	L-N	Own	4	Own	2R	77.6	OPXM	224	196	9300	24x10.50B	24x10.50DB
White 643	*32000	6950	Own	H	6	4⅝x5¾	519.0	45.9	118@2100	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Own	2R	66.5	O4IA	633	180	10900	24x10.50B	24x10.50DB
White 661	*32000	7250	Own	H	6	4⅝x5¾	580.0	51.3	127@2050	C	Own	Own	Spic	Ross	Zen	P	DR	Own	5	Own	2R	63.0	O4IA	623	129½	12200	24x10.50B	24x10.50DB
*White 642 SW320	*34000	8025	Own	H	6	4⅝x5¾	519.0	45.9	118@2100	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Tim	Wo	55.6	OTIA	833	198	12670	20x9.00B	20x9.00DB
*White 643 SW420	*40000	8550	Own	H	6	4⅝x5¾	519.0	45.9	118@2100	C	Own	Own	Spic	Ross	Zen	P	L-N	Own	4	Tim	Wo	69	OTIA	833	198	14400	40x8	40x8D
Willys-Overland 6-C-113	½	415	Own	L	6	3¼x3⅞	193.0	25.3	65@3400	C	Fed	Own	Spic	Own	Til	P	Aut	Own	3	Own	So	12.4	B4IM	143	113	1920	19x6.00B	19x6.00B
Willys-Overland 6-C-131	1½	595	Own	L	6	3¼x3⅞	193.0	25.3	65@3400	C	Fed	Own	Spic	Own	Til	P	Aut	W-G	4	Cla	Sp	40.8	B4IM	235	131	2750	20x5.50B	32x6P
Willys-Overland 6-C-157	1½	675	Own	L	6	3¼x3⅞	193.0	25.3	65@3400	C	Fed	Own	Spic	Own	Til	P	Aut	W-G	4	Cla	Sp	40.8	B4IM	235	157	3050	20x6.00B	20x6.00DB

GENERAL NOTATIONS

***†REFERENCE MARKS** apply to individual lines only and explanations are given under the subdivision for each company in the "SPECIAL NOTATIONS."

CAPACITIES given in this table are in tons or fractions of tons. *Shows maximum allowable gross weight in pounds.

ENGINE—Bud, Buda; Con, Continental; Cum-D, Cummings-Diesel: Her, Hercules; Lyc, Lycoming; Pont, Pontiac; Wak, Waukesha: Wis, Wisconsin; Hall, American Car & Foundry; Ster, Sterling Engine Co.

VALVE ARRANGEMENT—L, "L" head; H, in head, O. overhead; S. sleeve.

TYPE OF CAMSHAFT DRIVE—G, gear; C, chain.

RADIATOR MAKE—G&O, G. & O. Mfg. Co.; Fer, Perfex Corp; Long, Long Mfg. Co.; Har, Harrison Radiator Corp; Fed, Fedders Mfg. Co.; McC, McCord Radiator & Mfg. Co.: Mod, Modine Mfg. Co.; Hex, Hexcel Radiator Co. Yo, Young.

CLUTCH MAKE—Jon, Jones Clutch & Gear Co.; Ful, Fuller & Sons Mfg. Co.; Borg, Borg & Beck Co.; Br-L, Brown Lipe Gear Co.; Rock, Rockford Drill & Machine Co.; Cov, Covert Gear Co.; Long, Long Mfg. Co.; Detr, Detroit Gear & Machine Co.; Mer, Merchant & Evans; Hel, Merchant & Evans.

UNIVERSALS MAKE—Spic, Spicer Mfg. Co.; Bio, Blood Bros. Machine Co.; Sup, Superior Universal Products; Un, Universal Products Co.; Cle, Cleveland Steel Products Corp.; Pet, Peters; Opt, optional; Mec, Mechanics Machine Co.

STEERING GEAR MAKE—Ross, Ross Gear & Tool Co.; Han, Hannum Mfg. Co. Sag, Saginaw Steering Gear Co.; Gem, Gemmer Mfg. Co.; Col, Columbus Gear & Pump Co.; W-G, Warner Gear Corp.

CARBURETOR—Car, Carter; Mar, Marvel; Sch, Wheeler-Schebler; Str, Stromberg; DL, Detroit Lubricator; Til, Tillotson; Zen, Zenith-Detroit.

FUEL FEED—Gra, gravity; Vac, vacuum tank; P, fuel pump.

ELECTRICAL SYSTEM — AB, American-Bosch; Aut, Electric Auto-Lite; Eis, Eisemann; L-N, Leece-Neville; NE, North East; RB, Robert Bosch; DR, Delco-Remy.

TRANSMISSION—Br-L, Brown-Lipe; Cov, Covert; Ful, Fuller; Mec, Mechanics Machine; Mun, Muncie; W-G, Warner Gear; Cot, Cotta Gear Co.; Cla, Clark Equipment Co.

REAR AXLE—Cla, Clark Equipment; Col, Columbia; Eat, Eaton; Pont, Pontiac; Sal, Salisbury; Tim, Timken; Wis, Wisconsin.

FINAL DRIVE—IG, internal gear; St, straight bevel; Sp, spiral bevel; Wo, worm; 2R, double reduction; Ch, chain; S-T, semi-transverse.

TYPE OF SERVICE BRAKES—

B4IM, Bendix, 4 wheel internal mechanical; B4MV, Bendix, 4 wheel, mechanical, vacuum: B6IA, Bendix, 6 wheel, internal, air; B4IMV, Bendix, 4 wheel internal mechanical, vacuum; BO4IMV, Bendix, own, 4 wheel, internal, mechanical, vacuum: BrIA, Bendix, operating on 4 rear wheels, internal air; BW4IM, Bendix front, Wisconsin rear, 4 wheel, internal, mechanical: BE4IM, Bendix front, Eaton rear, 4 wheel, internal, mechanical; B4IH, Bendix 4 wheel, internal, hydraulic.

CB4IM, Columbia, Bendix, 4 wheel, internal, mechanical; C4IM, Columbia, 4 wheel, internal, mechanical; K2IM, Clark, 2 wheel, internal, mechanical: CR4IA, Christensen-Relay, 4 wheel internal, air.

L4IHVA, Lockheed, 4 wheel, internal, hydraulic, vacuum, air; LO4ID, Lockheed, own, 4 wheel, internal, drive shaft; LO4IV, Lockheed, own, 4 wheel, internal, vacuum, LT4DV, Lockheed, Timken, 4 wheel, drive shaft, vacuum; L4IH, Lockheed 4 wheel, internal, hydraulic: L4IHA, Lockheed 4 wheel, internal, hydraulic, air; L4IHV, Lockheed, 4 wheel, internal, hydraulic, vacuum; LT4IHV, Lockheed, Timken, 4 wheel, internal, hydraulic, vacuum; LT4IVA, Lockheed, Timken, 4 wheel, internal, vacuum, air; L6IHV, Lockheed, 6 Wheel, internal, hydraulic, vacuum; L6IH, Lockheed, 6 wheel, internal, hydraulic.

O2IM, Own, 2 wheel, internal, mechanical; O2IV, Own, 2 wheel, internal, vacuum; O4IA, Own, 4 wheel, internal, air; O4IH, Own, 4 wheel, internal, hydraulic; O4IHV, Own, 4 wheel internal, hydraulic, vacuum; O4IM, Own, 4 wheel, internal, mechanical; O4IV, Own, 4 wheel, internal, vacuum; O4M, Own, 4 wheel, mechanical: O2XM, Own, 2 wheel, external, mechanical; O4XM, Own, 4 wheel, external, mechanical; O6IA, Own, 6 wheel, internal, air; OJXM, Own, jack shaft, external, mechanical; OL4IHV, Own, Lockheed, 4 wheel, internal, hydraulic, vacuum; OPX, Own, propeller shaft; external; OPXM, Own, propeller shaft, external, mechanical; OPM, Own, propeller shaft, mechanical; ORIV, Own, rear wheels, internal, vacuum; OTIHV, Own Timken, internal, hydraulic, vacuum.

S4IM, Steeldraulic, 4 wheel, internal, mechanical.

T4rIA, Timken, operating on 4 rear wheels, internal, air; T4IA, Timken, 4 wheel, internal, air; T6IA, Timken, 6 wheel, internal, air; T2IMV, Timken, 2 wheel, internal, mechanical, vacuum.

VB—Vacuum Booster.

W4I, Westinghouse, 4 wheel, internal; W4IA, Westinghouse, 4 wheel, internal, air; 46IA, Westinghouse, 6 wheel, internal, air; 4IA, 4 wheel, internal, air; 4IH, 4 wheel, internal, hydraulic; 4M, 4 wheel, mechanical.

-T, True-stop. *Models on which Trustop is optional.

WHEEL BASES given are standard, but optional wheel bases are available in many cases.

***CHASSIS WEIGHT** according to Automotive Daily News formula, which is the chassis with gas, oil, water and spare tire, but without cab or other equipment.

TIRES—B, balloon; D, dual, S, solid; P, pneumatic.

SPECIAL NOTATIONS

AUTOCAR

*For tractor use only.
**Six wheeler driving from 4 rear wheels.
***Engines in these models are located under driver's seat.

BROCKWAY

*Models equipped with twin ignition.

CHEVROLET

Utility model available on 131-inch wheel base with chassis weight of 2,760 pounds and equipped with dual rear wheels.

DIAMOND T

*Six-wheelers.
Additional standard wheel base available as follows:

510	158	750	167, 192
504A	166½	801	180½, 199½
506A	174	1201	174½, 180
603	157, 179	1602	174½, 180
606B	177½	1603	184

DODGE

*Models F40, F41, F61 and F62 can be had with double drop frame.
†Six wheelers.

FEDERAL

†Six-wheelers.
*Also rated in pounds at total allowable weight as follows:

D 3	8,500	A 600 S W	20,000
E 3	8,500	A 600 D	20,000
F 7	10,000	U S	21,000
F 8	11,500	U 6 D R	21,000
A 6	13,500	A 6 S W	18,500
A 6 T	15,000	G 7	24,000
A 6 T W	15,000	G 7 W	24,000
T 3 W	14,000	G 8	24,000
T 8 W P	15,000	G 8 W	24,000
D 2 S W	12,500	X 8	30,000
E 2 S W	12,500	X 8 D R	30,000
D 2 D	12,500	X 8 R	30,000
2 E D	12,500	X 8 R D R	30,000
A 600	15,000	A 600	15,000
A 600 T	17,000	A 600 T	17,000
A 600 T W	17,000	A 600 T W	17,000
A 600 T D R	17,000	A 60 T D R	17,000
T 10 B	18,000	A 600 S W	20,000
T 10 W	18,000	A 600 D	20,000
T 10 D R	18,000	T 3 W F A	16,000

†Both the four and six cylinder are also offered in 157-inch wheel base at $1,145 and $1,345, respectively.
Model T 10 SW also available in 206 and 224 inch wheel bases.

GENERAL MOTORS TRUCK

*Capacity indicated is the Straight Rating (combined weight of chassis body, equipment and pay load) for which each chassis is designed and guaranteed to satisfactorily operate under average conditions. The size of the tires used does not affect this Straight Rating, but to secure maximum tire mileage it is suggested that the total gross weight be limited to a "recommended gross weight" for each tire equipment based on tire capacity. Prices cover base chassis and vary with wheel base and tire combinations. The number of wheel base lengths, tire types, range of "recommended gross weights" and resulting pay load range (assuming nominal body allowance) for each model follow:—

Note: Models T-15 to T-61, inclusive, are available for export only as coach chassis.

Model	Wheel Bases	Tire Types	Range of "Rec. Gross Weights"	Pay Load Range
T-15	3	10	4500- 5500	½-1½
T-18	2	..	7500- 8200	1½-2
T-19	4	..	7500-10000	1½-2½
T-23	2	..	8500-10000	2-3
T-25	3	17	6800- 9000	1½-2
T-26	4	..	9000-11000	2-3
T-30	3	15	10000-12500	2-3
T-31	4	..	11000-14000	2½-4
T-42	4	12	12000-15000	2½-4
T-44	4	12	12000-16000	3-4½
T-45	4	..	13500-16000	3-4½
T-51	4	..	16500-19000	4-5½
T-60	4	18	18500-22000	5-6½
T-61	4	..	19500-22000	5-6½
T-82	4	12	19000-24000	5-7
T-83	4	..	20000-25000	5-7½
T-85	3	..	25000-30000	6-8
T-90	3	..	22000-28000	5-7½
T-95	3	..	30000-40000	7-11
T-110	3	..	32000-40000	8-12
T-130	3	..	42500-50000	12-15

Optional rear axle gear ratios available for all models, except Model T-18. Double reduction axles available for Models T-45, T-51, T-60, T-61, T-82, T-83 and T-95.

GRAMM

Series	Straight Rating	Wheel Base	Pay Load Range
AX 4	8,000	157	1 to 1½ tons
AX 6	8,000	157	1 to 1½ tons
BX 4	10,000	157	1½ to 2 tons
BX 6	10,000	157	1½ to 2 tons
CX 4	12,000	157-180	2 to 3 tons
CX 6	12,000	157-180	2 to 3 tons
B	12,000	157-174	1¾ to 2½ tons
CXH	13,400	157-180	2 to 3 tons
C	14,000	145-196	2 to 3 tons
EX	16,500	145-210	3 to 4 tons
D	17,000	145-196	2½ to 4 tons
E	20,000	145-224	3 to 4½ tons
ED	20,000	145-210	3 to 4½ tons
EY	.....	.....	3 to 4 tons
G	24,000	165-235	4 to 6 tons
G S	24,000	165-235	4 to 6 tons
GY	.....	.....	4 to 5 tons
GW	28,000	157-240	5 to 7½ tons
GWD	30,000	157-240	5 to 7½ tons
HY	.....	.....	5 to 6½ tons

†Both the four and six-cylinder are also offered in 157-inch wheel base at $1,145 and $1,345, respectively.

Larger engines and corresponding transmissions, clutches, propeller shaft, axles, etc., are provided on all models of Gramm trucks at extra cost when type of service requires them. Wheel bases, cab to rear of frame, and cab to center line of axle designations may change to suit the special requirements.

Wisconsin double reduction axles are available in all series, except AX and BX.

Gross vehicle weight indicated for each model in the table is the straight rating (combined weight of chassis, body, equipment and payload) for which the chassis is designed and guaranteed to satisfactorily operate under average conditions. Tire sizes should be selectd within the tire manufacturers rating to carry the gross load desired which must not exceed the straight rating.

INDIANA

*Six-wheelers.

INTERNATIONAL

Brake H. P. values given for International motor trucks are net values obtained with all standard equipment accessories running.

PIERCE-ARROW

*Optional final drive on models except "S" and "T" series.
†Six-wheelers.

REO

Model 2 D can be secured in 166-inch wheel base at $1,095.
†Heavy duty.

STEWART

Model 41X also supplied 134-inch wheel base.

Models 42X and 43X also supplied in 145, 160, 176-inch wheel base.

Model 29XS can be supplied in 135, 160, 176 and 190-inch wheel base.

*Models 18X and 32X can be supplied in 148, 190 and 220-inch wheel base.
*Models 19X, 31X and 27XS can be supplied in 148, 172, 190, 220 and 235-inch wheel base.
As optional equipment Models 18X, 19X, 31X and 27XS can be supplied with Timken dual reduction rear axle.
Models 38-8, 38-6, 48-8 and 58-8 can be supplied in 160, 170, 180, 196, 226 and 241-inch wheel base and worm axle.

WHITE

Six-wheelers.

CLASSIFIED ADVERTISEMENTS IN THE AUTOMOTIVE DAILY NEWS BRING RESULTS

1933—AN OPEN LETTER

The following letter, originally written to Graham Distributors and Dealers, contains many facts regarding the progress and plans of the Graham organization which, we believe, will be of real interest to all motor car dealers. We are, therefore, reproducing this timely message as an open letter to the automobile trade.

GRAHAM-PAIGE MOTORS CORPORATION, DETROIT

TO ALL DISTRIBUTORS AND DEALERS: SUBJECT: GRAHAM 1933 PROGRAM

To every Graham Distributor and Dealer we can say with complete confidence that, when you will have learned the complete details of our 1933 program, you will agree with us that it is not only the most attractive, desirable and profitable opportunity which this factory has ever had the privilege of laying before you, but one which cannot be matched in the entire industry.

The past year has shown many factors of unusual strength in Graham's position, and has clearly indicated to us other things which we plan to do to strengthen further that position and to add substantially to the profit opportunities open to every Graham Dealer.

All these things have been taken into consideration in the development of our unusually attractive 1933 program.

1932 conclusively established the wisdom of the distinct and important style and engineering changes which distinguish the new Graham cars we introduced to you a year ago, and which are now being so widely imitated.

1932 proved with equal conclusiveness the outstanding superiority of these cars from every standpoint of appearance, performance and value.

It is doubtful if any group of automobile owners in the industry's history ever approached the enthusiastic satisfaction everywhere expressed by the men and women who own and drive Graham cars.

Certainly, no other dealer organization in the industry is backed by any such active and constantly growing owner goodwill as that which is at work on behalf of Graham Dealers today everywhere.

As a result of all this, 1932 witnessed remarkable gains in Graham's competitive position.

For example, Graham Eight registrations for the first ten months of 1932 vs. the first ten months of 1931 achieved the highest percentage of sales gain among all eight cylinder cars in the market regardless of price—a gain of 84%—while not one other competitive Eight sold as many cars in the first ten months of 1932 as in the same period in 1931.

During the latter months of the year, many Graham Dealers were consistently outselling every one of their long-established competitors.

The percentage of the industry's total sales which Graham Dealers can reasonably and conservatively expect to do today has increased so substantially that even a moderate upturn in retail sales volume should put every Graham Dealer in a strong profit position.

We have good reason to expect confidently a substantial increase in Graham sales in 1933 with profit to Graham Distributors and Dealers, even should there be no radical improvement in general economic conditions—consequently, the greater the degree of improvement, the greater will be the rewards to Graham Dealers and salesmen.

We have fortified the position of Graham Dealers also in relation to price competition.

We do not believe that the best interests of any Dealer are served in the bitter competition of the "lowest-price" market.

This belief, which we have expressed in two recent advertisements in the automotive trade papers, has been repeatedly confirmed by actual experiences of dealers who have competed in "the battle of price tags," only to discover that sales volume does not always mean net profit.

At the same time, we have recognized that buyers today are demanding more value for their money than ever before, and that we must supply our Dealers with a product which meets these requirements.

Our 1933 program will do this.

The past year has emphasized more strongly than ever the importance to every dealer of doing business on a "net profit" basis—of an adequate dollars and cents margin between cost and selling price.

Our 1933 Graham program provides this highly necessary "net profit" opportunity.

The past year has called on reserves of courage, determination and ability that none of us knew we possessed—has taught us a great many things that we will put to profitable use in 1933.

The Graham 1933 program, details of which will be presented in a nation wide series of Dealer Meetings during the first week in January, has been solidly built, stone by stone, out of the bed rock of our 1932 gainful experience.

And we are approaching 1933 with the happy confidence that our new series of cars, which will be shown you during the first week in January, and our selling program for 1933, will offer to you the most attractive profit opportunity available in the entire industry today.

Sincerely,

Robert C. Graham

Vice-President

GRAHAM-PAIGE MOTORS CORPORATION

GRAHAM